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CÆSAREAN SECTION: A REVIEW OF 486 CONSECUTIVE OPERATIONS AT THE WOMEN'S HOSPITAL, MELBOURNE.¹

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THE Cæsarean operation has been used as a method of delivery on the live patient for the last four hundred years, but it is only during the present century that its indications have been properly recognized, its technique refined, and its results vastly improved. This has been due in no small measure to the publication of results by different surgeons who have produced a collective experience of the greatest value. Many series of cases have

been published, mostly from Great Britain, the United States of America and Germany, but as yet, so far as is known, no considerable number has been submitted from Australia. In order, therefore, to ascertain our results at the Women's Hospital, Melbourne, the records for the last fourteen years, from July, 1920, to June, 1934, have been reviewed. This period has been taken for two reasons: first, because the histories before 1920 are often incomplete; and, secondly, on account of the Great War, which disorganized the honorary staff. During the period under review the operations have been done by fourteen surgeons in the maternity department of the hospital, and to those whose cases are included I here tender my acknowledgement.

The term Cæsarean section is confined to that operation in which laparotomy, followed by an incision in the uterus and extraction of the child, has been done on a patient at least twenty-eight weeks pregnant. Other cases of abdominal delivery will be considered separately.

¹ Read at a meeting of the Victorian Branch of the British Medical Association on September 5, 1934.

Incidence.

During the period under review 40,183 women were confined at the Women's Hospital, Melbourne; of these, 486 were delivered by Cæsarean section, giving an incidence of 1.2%. This is probably much higher than occurs in private practice, but the reason is undoubtedly because of the concentration of abnormal cases in public hospitals and the tendency for those patients to return for subsequent deliveries. The range in incidence in different clinics is amazing; thus at the Rotunda Hospital it was 0.27%,⁽¹⁾ while at the twelve largest hospitals in Los Angeles it amounted to 21.6%.⁽²⁾

Indications.

The following were the reasons for the operation.

Contracted pelvis and disproportion	312
Eclampsia	35
Renal toxæmia	19
Contracted pelvis with eclampsia or renal toxæmia ..	7
<i>Ante partum</i> hæmorrhage	49
Stenotic conditions	14
Obstructing tumours and myomata	13
Medical conditions	13
Repeat sections, not contracted pelvis	8
Malpresentations	5
Prolapsed cord	3
Hydrocephalus	2
Infected uterus	1
Repeated stillbirths	1
Abdominal hæmorrhage	1

In addition there were six *post mortem* Cæsarean sections.

The Operation.

There are two common methods of performing intraperitoneal Cæsarean section: the classical and the lower uterine segment.

In the classical operation a 15.0 centimetre (six inch) paramedian incision is made in the abdominal wall, commencing from a point 5.0 centimetres (two inches) above the umbilicus; the uterus is opened vertically in its mesial plane and the child is extracted by the leg. The placenta and membranes should be removed without turning the uterus inside out, as this is unnecessary and requires an amount of force which is liable to produce trauma to the uterine muscle. The uterine wound is repaired by two layers of chromicized gut in the muscle layer and a continuous catgut suture through the peritoneal coat. The suturing should be done both carefully and accurately in order to control hæmorrhage, to obliterate any space between the muscle edges, and to leave no raw area which might produce adhesions.

There are two varieties of the so-called lower segment operation. In both the mid-line abdominal incision is placed as low as possible, extending to the pubes, and then the peritoneum between the bladder and the uterus is opened transversely from one round ligament to the other. The bladder and its peritoneum are reflected downward as far as possible to expose a bare area on the anterior surface of the lower part of the uterus and the

cervix. In the first variety the incision in the uterus, or rather, in the lower uterine segment, is made transversely 15.0 centimetres (six inches) long with a slight convexity downwards. A forceps blade is then introduced behind the foetal head, which is lifted up and delivered by pressure on the fundus of the uterus. The child is now completely extracted by pulling on the head, and the placenta is manually removed, the uterus remaining in the abdominal cavity throughout. The uterine incision is sutured with two layers of chromicized gut and then the reflected peritoneum is brought back to its original position with a continuous catgut suture. This is a more difficult operation than the classical one, owing to the limited space in which it is carried out, and sometimes there is severe hæmorrhage at the lateral ends of the uterine wound. In the second variety the uterine incision is a vertical mid-line one, but unless the patient is in labour and the retraction ring is high, it is very difficult to keep the 15.0 centimetre (six inch) incision confined to the lower segment; consequently it might be advantageous to call this technique "low Cæsarean section" and to reserve the term "lower segment section" to that operation in which the transverse incision is used. The vertical incision should always be employed when the patient is not in labour; and if the incision extends above the peritoneal reflection the bladder peritoneum should be attached sufficiently high to cover the uterine incision completely, for if this is done most of the advantages of the lower segment operation are obtained. Both the low and the lower segment operations are especially indicated when the patient has been in labour for some time, and it is in these cases that the operation becomes easier in proportion to the amount of expansion of the lower uterine segment.

Contracted Pelvis and Disproportion.

Contracted pelvis and disproportion will always be the most frequent indication for Cæsarean section, being present in nearly three-fourths of the cases in this series.

Where the conjugate diameter is not more than 6.25 centimetres (two and a half inches), which is fortunately rare in this country, vaginal delivery of a full term child is impossible, even after a destructive operation. An elective section is also indicated when there is disproportion between the foetal head and the pelvis sufficient to cause definite over-riding towards the end of pregnancy or during the early part of labour. In these two groups a decision can easily be made, but in the majority of cases the disproportion is not so marked, and for these the "trial of labour" should be used. The patient is allowed to come into labour and she is carefully watched to see whether the head descends as the labour progresses. This is a perfectly safe procedure to both mother and child if the decision as to the method of delivery is not unduly prolonged. As will be explained later, this decision should be made within four hours of the rupture of the

membranes. A trial of labour is admittedly a confession of ignorance, but it is quite impossible to foretell the strength of the uterine contractions and their effect on the foetal head, and the majority of patients who are submitted to a trial of labour do eventually deliver themselves safely.

Occasionally patients are seen who have been in labour for a considerable time and when it is obvious that there is obstruction due to disproportion. If the child is dead, a destructive operation becomes necessary; but if the child is still alive, even after failure to deliver by forceps, it should be delivered by abdominal section with certain safeguards.

Previous stillbirths from dystocia are an indication for section, when the age of the patient makes subsequent pregnancies uncertain; but a young patient who has had only one stillbirth due to a slight degree of contracted pelvis should be treated by induction.

Another indication for the Caesarean operation in the presence of a contracted pelvis occurs when surgical induction, either by the introduction of a foreign body into the uterine cavity or by rupture of the membranes, has failed to bring the patient into labour. In such a case section should be considered after a few days, but should there be a rise in temperature suggesting the onset of infection, section should be done immediately.

The elective operations were all done on patients who were either not in labour or in whom labour pains had been present only a short time, and in no case were the membranes ruptured at the time of operation. The *primiparae* towards the end of pregnancy or early in labour exhibited signs of definite disproportion which was considered too gross to permit of vaginal delivery, while the *multiparae* all gave histories of previous dystocia resulting in stillbirths and often in destructive operations.

The dictum "once a Caesar, always a Caesar" has apparently been the rule in contracted pelvis cases, as there have been very few who have had natural labours after a Caesarean delivery. Risk of rupture of the uterine scar and the ability to obtain a more fully developed child are both good reasons why operation is preferable to the induction of premature labour in the presence of a contracted pelvis. A minor reason has been the desire for sterilization, usually at the patient's request. It will be noticed that 40% of patients were sterilized after their second section, while 80% were sterilized after their third operation.

The third group includes patients who were subjected to a properly conducted trial of labour in the hospital and where section was decided upon within a few hours of rupture of the membranes, together with others who had been in labour for a much longer time, either in the hospital or before their admittance.

The miscellaneous group is self-explanatory.

There were 319 cases of contracted pelvis and disproportion, as follows:

1. Elective	68
<i>Primiparae</i>	28
<i>Multiparae</i>	40
Type of operation—	
Classical	65
Lower segment	3
With sterilization	3
Complicated by eclampsia	2
Results.—Mother: 2 died (1 pulmonary embolus, 1 uraemia). Child: 1 stillbirth, 1 neonatal death.	
2. Elective repeat operation	104
Second section (sterilized, 35)	88
Third section (sterilized, 12)	15
Fifth section (sterilized, 1)	1
Type of operation—	
Classical	102
Lower segment	1
With hysterectomy (myoma)	1
Results.—Mother: None died. Child: 2 neonatal deaths.	
3. After trial labour or late in labour	136
<i>Primiparae</i>	95
<i>Multiparae</i>	41
Type of operation—	
Classical	95
Lower segment	38
With hysterectomy	3
With sterilization	2
Complicated by eclampsia	4
Complicated by preeclampsia	1
Results.—Mother: 7 died (4 sepsis, 1 sepsis and embolus, 1 paralytic ileus, 1 general peritonitis and eclampsia). Child: 6 stillbirths, 2 neonatal deaths.	
4. Miscellaneous	11
No labour after tube induction	4
Type of operation—	
Classical	2
Lower segment	2
No labour after Johns Hopkins stimulus	2
Type of operation—	
Classical	2
After "failed forceps"	5
Type of operation—	
Classical	2
Lower segment	2
With hysterectomy	1
Results.—Mother: None died. Child: 3 stillbirths.	

Results in Contracted Pelvis Cases.

The maternal mortality among the contracted pelvis cases was 2.8%, and of the nine patients who died six were frankly septic. In Holland's⁽³⁾ analysis of 1,953 sections operations were classified as having been done before labour, early in labour, late in labour, after induction, and after attempts at delivery; and he showed that the incidence of sepsis varied with the length of labour and the amount of interference. In our cases there is an obvious line of demarcation at the time of rupture of the membranes (see Table I).

TABLE I.

Condition of Membranes.	Number of Cases.	Maternal Mortality.
Intact	198	1.0%
Ruptured	121	5.8%

An analysis of the group of patients who were operated upon after a trial of labour or late in labour shows the influence of the time factor on both the maternal and foetal mortality. It will be seen that the maternal mortality was seven times greater when the operation was delayed more than twelve hours after rupture of the membranes (Table II).

The incidence of sepsis will obviously be lessened if patients are operated on within twelve hours of the rupture of the membranes and this should be remembered in the treatment of all patients who have a trial of labour, whether intended or not. When the trial of labour was first recommended in border-line contracted pelvis cases it was advised that a final decision as to the method of delivery should be made not later than four hours after the membranes ruptured. If this rule is adhered to, patients who require it will be sectioned during a comparatively safe period, and good results should follow to both mother and child. If, however, the case has been neglected, or if infection is suspected or is definitely present, the lower segment operation or hysterectomy should be used. In the lower uterine segment operation the operative area can be isolated from the general abdominal cavity, the uterus need not be delivered, but can be left *in situ* throughout the operation, the uterine wound can be completely peritonealized, and efficient drainage is easily obtained by a suprapubic tube. In cases in which infection is known to be present, the removal of the uterus is obviously the best method of removing the source of the disease. Among the contracted pelvis cases, 46 lower segment operations and five hysterectomies were done, the classical operation having been abandoned in the majority because of the probability of infection. Of these 51 patients, three died—one of sepsis, one of paralytic ileus, and one of pulmonary embolus. By present-day standards the number of lower uterine operations in this series is remarkably small; for example, among 1,059 sections performed at the Chicago Lying-in Hospital⁽⁴⁾ there were 874 through the lower segment, with a mortality of 1.26%, and 147 classical operations with a mortality of 4.76%. These figures also illustrate the greater safety of the low operation, which has become deservedly more popular during recent years.

From our own results the following can be strongly recommended. The classical operation may be used with safety for patients not in labour, or early in labour with the membranes intact, but all patients with ruptured membranes should be treated by section through the lower segment. Hysterectomy

should be done in every patient who shows signs of infection or when the membranes have been ruptured a considerable time or when, from a history of repeated vaginal examinations or attempts at delivery, infection may be considered certain. Subtotal hysterectomy does not unduly prolong the operation and, when indicated, will often prove a life-saving measure.

Eclampsia.

The cases of eclampsia numbered 44. They were comprised as follows:

Complicated by contracted pelvis	6
Parity 1	32
2	6
3	2
5	1
10	1
11	2

Nine mothers, or 20%, died from toxæmia *et cetera*. Seven children were stillborn; there were three neonatal deaths.

In 1922, at the British Congress of Obstetrics and Gynaecology, it was shown that the mortality accompanying Cæsarean section for eclampsia reached the very high figure of 23.8%, being exceeded in bad results only by *accouchement forcé*. As a result of this the operation was used less often in the treatment of eclamptic patients at this hospital, till in 1925-1926 no patient with eclampsia was submitted to section. Soon afterwards, on publication of our results, criticism of the conservative treatment was received and it was suggested that the operation could be used with advantage in certain cases. It was then decided that when patients showed no improvement after a certain period of intensive medical treatment, abdominal delivery should be considered. In pursuance of this, only 13 sections were done in the last nine years, contrasting with 31 in the previous five years, but the mortality among these 13 patients was 36%. It must be understood, however, that all those patients were desperately ill and were progressively growing worse, in spite of medical treatment, so that many would have died no matter what treatment was adopted. In addition, the operation was so long delayed that its value as a method of treatment in eclampsia can scarcely be fairly assessed. Our experience, however, is such that we must strongly condemn the use of section in this condition. Operation should be done only in those cases of eclampsia which are complicated by contracted pelvis, and then it should be done as early as possible.

TABLE II.

Condition of Membranes.	Number of Cases.	Lower Segment Operation.	Hysterectomy.	Maternal Mortality.	Foetal Mortality.
Intact or within twelve hours of rupture ..	100	19	0	2%	2.0%
Ruptured over twelve hours	36	19	3	14%	16.5%

The eclamptic toxæmia should be considered a medical disease comparable with uræmia, even though pregnancy is its original ætiological factor. When the patient reaches the stage of convulsions there is widespread pathological change, mainly in the kidneys and liver, which calls for eliminative measures rather than a major operation. More lives would be saved if eclamptic patients before being sent to the hospital were given a purgative instead of the usual injection of morphine, which both delays treatment and fails to control the condition.

Renal Toxæmia.

Cases of renal toxæmia numbered 20; they were comprised as follows:

Complicated by contracted pelvis	1
After failed tubal induction	3
Type of operation—	
Classical	19
With hysterectomy (labour 4 days)	1
With sterilization	8

Two mothers, or 10%, died of eclamptic toxæmia. Two children were stillborn and there were six neonatal deaths.

Either the incidence of renal toxæmia is increasing or there is a change with regard to its treatment, for sixteen of the twenty operations occurred in the last three years.

Like eclampsia, renal toxæmia is accompanied by a high mortality rate when treated by section; and if we agree that the former is best treated medically, then surely the latter should be treated likewise. Medical treatment and, if necessary, induction should be the routine treatment, and section should be reserved for those patients in whom induction fails or when the patient is in labour with signs of disproportion. It is most important that the medical treatment be efficient. The patient should first be purged and then the bowels should be kept acting regularly two or three times a day. She should take no food except glucose or sugar, and should drink plenty of water. If the signs of toxæmia, raised blood pressure, albuminuria and œdema have not disappeared within four days, or if during the treatment the condition grows worse, induction should be done at once. An occasional exception may be made when a patient, acquainted with the risks, is carried on in order to get a more fully developed child; but the onset of eclampsia, foetal death and permanent damage to the kidneys are three possible dangers which should be kept in mind.

Sterilization should not be an excuse for opening the abdomen when the patient is suffering from a grave toxæmia, but can more safely be left until she has recovered from her confinement.

Placenta Prævia.

In the series there were 35 cases of *placenta prævia*; they were comprised as follows:

Primipara	7
Multipara	28
Type of operation—	
Classical	34
Lower segment	1

One mother (2.9%) died of a pulmonary embolus. One child was stillborn and there were four neonatal deaths.

None of the 35 patients was in labour, and the varieties of *placenta prævia* were: central, 14; marginal, 6; lateral, 15; and unclassified, 10. In some, vaginal packing had been used without producing labour pains. The average weight of the children was 3.15 kilograms (seven pounds).

Placenta prævia is a very dangerous condition to both mother and child, but our figures show that good results can be obtained by the use of Cæsarean section in selected cases. There are many different methods of treating this condition, as there are many different factors concerned, such as the position of the placenta, the presence or not of labour and the parity of the patient. The best results will be obtained only by grading the treatment to the particular case and not by tending to use the same method in all cases. Cæsarean section should be considered: in the treatment of any *primipara* not in labour with any degree of *placenta prævia*; in any case of central *placenta prævia*, whether the patient be a *primipara* or a *multipara*; and in any case of *placenta prævia* in which the child is a "good risk" and specially desired. The first two indications are principally for the safety of the mother, while the third is primarily in the interests of the child. When operation is decided upon it is essential that it should be done early and not as a last resort, and that the patient should not be exhausted from loss of blood. Should the patient suffer from grave anæmia, transfusion should be done before operation and, if necessary, during and after the operation as well.

Accidental Hæmorrhage.

There were 14 cases of accidental hæmorrhage, as follows:

Primipara	5
Multipara	9
Type of operation—	
Classical	2
With hysterectomy	12

Three mothers (21%) died, two of hæmorrhage, one of uræmia. All the children were stillborn.

All cases presented the classical signs of concealed accidental hæmorrhage.

One patient was particularly interesting in that the bleeding occurred shortly after an external version for breech presentation. This was the only case in which albumin was absent from the urine, and at operation the placenta was found completely separated. There was no toxæmia at any time, yet the uterus presented the typical appearance found in the cases due to toxæmia, suggesting that perhaps the condition may be due entirely to the effects of the hæmorrhage and not to the toxæmia. Hysterectomy was done when the uterus failed to contract after the operation, as *post partum* hæmorrhage was then feared.

One patient after classical section died of *post partum* hæmorrhage.

Recently in this hospital even the most severe forms of concealed accidental hæmorrhage have been

treated expectantly with success, and it is felt that in future this condition will not be considered a sufficient indication for Cesarean section.

Stenotic Conditions.

Stenotic conditions numbered 14, as follows:

Carcinomata—	
Cervix	3
Rectum and vagina	2
Type of operation—	
Classical	2
Subtotal hysterectomy	2
Wertheim hysterectomy	1
Atresia of the cervix—	
Post-operative	3
After radium	1
After previous craniotomy	1
Type of operation—	
Classical	4
Hysterectomy (membranes ruptured six days)	1
Cicatrix of the vagina—	
Post-operative	3
After childbirth	1
Type of operation—	
Classical	4

None of the mothers in this group died. Two children were stillborn.

Organic stenosis of the cervix, due either to new-growth or to dense cicatricial tissue which prevents dilatation of the cervix, makes the vaginal delivery of a full term child impossible. Similarly, when extensive scarring of the vagina, especially after repeated plastic operations, is present, abdominal delivery should be used.

It is interesting to note the subsequent history of the three patients with carcinoma of the cervix. One had the classical operation, the second subtotal hysterectomy, and the third Wertheim's hysterectomy, but all three died from twelve to fifteen months later. Another case of interest was that of a *multipara* who had been treated for menorrhagia with radium. She then became pregnant and at her labour the cervix would not admit the tip of the finger even after eighteen hours of strong pains.

Obstructing Tumours and Myomata.

There were in the series 13 cases in which obstructing tumours or myomata were present. They were as follows:

Uterine myomata	6
Pelvic dermoids	4
Pelvic chondrosarcoma	1
Retro-peritoneal cyst	1
Multilocular cyst (? ovarian)	1
Type of operation—	
Classical	10
With removal of tumour (dermoid)	4
Hysterectomy (myomata)	3

Two mothers died, one of tetanus and one of *post partum* hæmorrhage. Three children were stillborn and there was one neonatal death.

An obstructing tumour is an absolute indication for Cesarean section, both to deliver the child and, if possible, to remove the tumour. Uterine myomata are best treated by hysterectomy, as this operation

will prevent *post partum* hæmorrhage, degeneration in the tumour, and sepsis. One of the patients died of *post partum* hæmorrhage after the classical operation. Hysterectomy may also prevent the necessity of a future operation.

One patient died of tetanus, and shortly afterwards another case of tetanus occurred in the gynæcological department. Investigation traced the infection to the suture material, which had been sterilized by the biniodide method. It was proved that this method was unreliable, so the iodine method was adopted as the hospital routine.

Medical Conditions.

Medical conditions were regarded as indications for operation in 13 cases. These cases were as follows:

Mitral stenosis	8
Cardiac failure	1
Pulmonary tuberculosis	1
Pneumonia and cardiac failure	1
Multiple neuritis	1
Dementia præcox	1

Three mothers died, two of cardiac failure and one of pulmonary tuberculosis. One child was stillborn; there were two neonatal deaths.

Cesarean section is indicated in any case of cardiac failure which is controlled at term. It eliminates the muscular strain of labour and can be performed at a time when the condition of the heart is most satisfactory. In addition, there is reasonable certainty of a live child, and the necessary sterilization can be performed at the operation. The combined onset of cardiac failure with labour is a circumstance over which we may have no control, but it is not an indication for Cesarean section.

Repeat Sections for Conditions Other than Contracted Pelvis.

Repeat sections for conditions other than contracted pelvis were done on eight occasions, as follows:

Previous indication—	
Placenta prævia	3
Eclampsia	2
Renal toxæmia	2
Dystocia due to ventrofixation	1

No mothers died and all the children lived.

These operations were all done for fear that the scar would rupture, with the exception of the case of ventrofixation, in which, in addition, dystocia was again anticipated. Patients whose previous operation was done under ideal surgical conditions by a competent operator and unaccompanied by subsequent morbidity, should have a uterine scar sufficiently strong to withstand labour in the absence of disproportion. When the previous conditions are unknown, as in many of the above cases, the risk of rupture of the scar makes a second operation advisable.

Malpresentations.

Malpresentation was present in five cases. There were three brow presentations; all the patients were in labour, and one of them was operated on by the

lower segment route. There were two face presentations, both in patients in labour, one being a "failed forceps" case and the other a persistent mento-posterior. Hysterectomy was done in the latter. All mothers and children survived.

Prolapsed Cord.

In three cases the cord was prolapsed. All patients were *primiparae*, and the cord prolapsed with the head in two cases and with the breech in the other. One patient had the low operation. All the mothers survived, but one child was stillborn.

Hydrocephalus.

Hydrocephalus was present in two cases. Both operations were done on account of disproportion, the true condition not being recognized. The classical operation was used, both mothers surviving. One child was stillborn and the other died later.

Infected Uterus.

In one instance the uterus was infected. Tubal induction for dead foetus had failed, and the patient was admitted to hospital definitely infected, with a temperature of 39.4° C. (103° F.). A classical operation was done, followed by hysterectomy, and the patient survived.

Repeated Stillbirths.

One patient was operated on because of repeated stillbirths. This patient had had four previous macerated children. A live child, weighing 2.0 kilograms (four and a half pounds), was delivered by section, but died twenty-four hours later. No cause was discovered in either mother or child to account for the condition.

Abdominal Haemorrhage.

Abdominal haemorrhage was the cause of operation in one instance.

This patient, twenty-eight weeks pregnant, was diagnosed as probably suffering from concealed accidental haemorrhage with blood in the peritoneal cavity. At operation the abdomen was found full of blood arising from the rupture of retroperitoneal vessels in the right iliac fossa and broad ligament. Section was done to obtain better exposure. The patient died from further haemorrhage due to ineffective ligature.

Post Mortem Caesarean Section.

Post mortem Caesarean section was performed on six occasions. The cause of death of the mother was eclampsia in three cases, tuberculous bronchopneumonia, chronic nephritis with cerebral haemorrhage, and ruptured uterus. Two living children were obtained, one from an eclamptic and the other from the chronic nephritic patient.

Results and Conclusions.

In the series of 486 Caesarean sections 29 mothers died, giving a mortality rate of 5.9%, while of the children, 41 were stillborn and 23 died in the neonatal period—a total of 64, or 13% (see Table III).

Caesarean section, although a comparatively simple abdominal operation, is not the safe procedure it is popularly held to be. Certain obstetricians have published excellent results. Ivens Knowles⁽⁵⁾ had a maternal mortality of 1.99% among 352 consecutive cases, Quigley⁽⁶⁾ lost 1.2% of patients in 165 cases, while De Lee⁽⁷⁾ performed 620 lower segment sections with a mortality of 0.9%. Gauss,⁽⁸⁾ however, among 17,071 collected cases found the mortality to be 5.8%, which may be taken to be the average rate in institutions such as our own. When the operation is done by less experienced surgeons the rate is proportionately increased; and in the case of the general practitioners of Victoria it was estimated to be 12.5%.⁽⁹⁾ Two factors probably prevent our obtaining results better than the average: first, the Women's Hospital is the only institution in Melbourne to which desperate cases can be sent and, secondly, there is a local hospital system which compels honorary medical officers to pass, after a varying period, away from the obstetric work.

There are two factors concerned in the maternal mortality: that due to the operation and that due to the indication present. In this series the operation itself caused 2% of the deaths, while the indication was to blame in 3.9%. Thus even when all circumstances appear to be favourable there is a minimum mortality of about 2%, which is at least four times greater than that resulting from vaginal delivery. The usual cause of death is sepsis, and it has already been indicated how better results will follow the use of the lower segment operation and hysterectomy in certain cases. The mortality due to the indication should be capable of definite improvement by making the indications more rigid and definite. Disproportion, obstructing tumours, certain cases of *placenta praevia*, and genital atresia due to newgrowth or cicatricial tissue may be considered to be absolute indications for Caesarean section. All patients with medical conditions, including eclampsia and renal toxæmia, should as a rule be treated conservatively, but if operation is contemplated it should be only with the full knowledge of the risks attending its performance.

There are certain other rarer indications, such as occur in this series, in which the obstetrician, having regard to all the circumstances, will have to decide on the best and safest method of delivery. In a woman who can deliver herself naturally there is no justification for Caesarean section to perform sterilization; but if sterilization be necessary or desirable, it should be done at a later date.

Caesarean section has an important place in the armamentarium of the obstetrician, but while the maternal mortality remains so high, it cannot be considered an easy and safe escape from obstetrical difficulties. The better teaching of obstetrics and the realization of the dangers attending this operation can surely be trusted both to limit the indications for its use and to improve its results.

TABLE III.
Deaths of Deaths.

Number.	Age.	Para.	Indication.	Labour.	Rupture of Membranes.	Type of Operation.	Child.	Cause of Death.	Remarks.
I	28	4	Contracted pelvis.	No.	Intact.	Lower segment.	Alive.	Pulmonary embolus, thirteenth day.	Two previous stillbirths.
II	32	3	Contracted pelvis.	24 hours.	15 hours.	Classical.	Neonatal death.	Peritonitis, bronchopneumonia, two days.	Admitted with temperature of 40° C. (104° F.) six hours before operation.
III	26	1	Contracted pelvis.	Yes.	18 hours.	Lower segment.	Alive.	Sepsis toxæmia, four weeks.	Abdomen drained.
IV	33	2	Contracted pelvis.	Yes.	48 hours.	Classical.	Stillborn.	Sepsis toxæmia, four days.	After trial labour.
V	31	1	Contracted pelvis.	72 hours.	24 hours.	Classical.	Neonatal death.	Peritonitis, two days.	
VI	25	1	Contracted pelvis.	Yes.	Intact.	Classical.	Alive.	Double tuberculous pyonephrosis, uræmia, eight days.	Dwarf, albuminuria, tuberculous spine, pyonephrosis, abdomen opened.
VII	24	2	Contracted pelvis.	58 hours.	4 hours.	Lower segment.	Alive.	Paralytic ileus, two days.	Failed trial labour.
VIII	25	1	Contracted pelvis.	55 hours.	24 hours.	Classical.	Alive.	Bacillus welchii, septicaemia, four days.	
IX	27	1	Contracted pelvis and eclampsia.	12 hours.	2 hours.	Classical.	Alive.	General peritonitis, ruptured caecum, eclampsia, eight days.	After medical treatment.
X	21	1	Eclampsia.	No.	Intact.	Classical.	Stillborn.	Eclampsia toxæmia, cardiac failure, three hours.	Five fits, medical treatment for six hours.
XI	32	1	Eclampsia.	No.	Intact.	Classical.	Alive.	Eclampsia toxæmia, renal calculi, twelve days.	Nineteen fits.
XII	31	1	Eclampsia.	No.	Intact.	Classical.	Stillborn.	Eclampsia, bronchopneumonia, pyelonephritis, fourteen days.	
XIII	45	11	Eclampsia.	No.	Intact.	Classical.	Alive.	Double renal calculi, chronic nephritis, eclampsia, cardiac failure, one hour.	Seven fits, medical treatment, six hours.
XIV	21	1	Eclampsia.	No.	Intact.	Classical.	Alive.	Eclampsia toxæmia, nine hours.	Seven fits, medical treatment, seven hours.
XV	32	5	Eclampsia.	No.	Intact.	Classical.	Stillborn.	Chronic pyonephrosis, renal thrombosis, eclampsia, sixteen hours.	Medical treatment, fifteen hours.
XVI	18	1	Eclampsia.	No.	Intact.	Classical.	Stillborn.	Eclampsia, heart failure, eighteen hours.	Five fits, medical treatment, twelve hours.
XVII	27	3	Eclampsia.	No.	Intact.	Classical.	Alive.	Nephritis, Bacillus welchii, septicaemia, two days.	Medical treatment, twelve hours.
XVIII	30	7	Renal toxæmia.	No.	Intact.	Classical.	Alive.	Chronic nephritis, eclampsia, two days.	Immediate tube induction, section ten hours after admission.
XIX	39	5	Renal toxæmia.	No.	Intact.	Classical.	Alive.	Myocarditis, toxæmia, seven days.	Blood pressure 180 millimetres of mercury.
XX	35	4	Placenta previa.	No.	Intact.	Classical.	Alive.	Pulmonary embolus, fourteen days.	dyspnoea.
XXI	24	1	Acute hemorrhage.	No.	Intact.	Hysterectomy.	Stillborn.	Severe hemorrhage, solid albumin.	
XXII	43	11	Acute hemorrhage.	No.	Intact.	Classical.	Stillborn.	Hemorrhage, toxæmia, two hours.	Severe hemorrhage.
XXIII	46	10	Placenta previa.	No.	Intact.	Hysterectomy.	Stillborn.	Hemorrhage, uræmia, four days.	Severe hemorrhage, one-half albumin.
XXIV	24	2	Placenta previa.	No.	Intact.	Classical.	Neonatal death.	Pulmonary tubercula, exhaustion, one day.	Very advanced pulmonary tubercula.
XXV	37	5	Pneumonia.	No.	Intact.	Classical.	Stillborn.	Pneumonia, cardiac failure.	Under spinal anaesthesia.
XXVI	30	1	Mitral stenosis.	No.	Intact.	Classical.	Alive.	Cardiac failure, hemorrhage, obstetrical shock, six hours.	Discompensation.
XXVII	43	1	Myomata.	No.	Intact.	Classical.	Alive.	Post partum hemorrhage.	Slight albumin, blood pressure 160 millimetres of mercury.
XXVIII	35	1	Myoma.	No.	Ruptured.	Classical.	Alive.	Tetanus, eight days.	Failed John Hopkins stimulus.
XXIX	24	2	Abdominal hemorrhage.	No.	Intact.	Classical.	Stillborn.	Hemorrhage, one hour.	Ineffective ligature.

Abdominal Delivery, Not Cæsarean Section. Ruptured Uterus.

There were twelve cases of ruptured uterus, four patients being admitted to hospital with the uterus already ruptured. The remainder ruptured in hospital, four following a previous Cæsarean section.

Patients Admitted with a Ruptured Uterus.—The first patient, an albuminuric, had had high forceps applied unsuccessfully to an unrecognized hydrocephalic head. The second uterus had ruptured on manipulations for transverse presentation. The third patient was sent to hospital with the sole information that manual removal of the placenta had been done. On examination the cut end of the cord was found at the vulva, but the child was found in the abdominal cavity. In the fourth case, that of a 13 para, the uterus had ruptured after an obstructed labour lasting over three days. Hysterectomy was done in each case, but all the mothers died, two on the table and the other two later from infection.

Rupture of a Previous Cæsarean Scar.—These patients were all in hospital at the time of rupture, and each had had only one previous section. The first two were not in labour and the uterus ruptured silently. The third, whose previous operation had been done for hydrocephalus, was given medicinal stimulative treatment, including pituitrin, in order to induce labour. Rupture took place two and a half hours after the fourth dose of 0.25 cubic centimetre of pituitrin. The fourth patient had been in labour for twelve hours and the uterus ruptured after the patient had been prepared for a repeat section. The first three patients were treated by hysterectomy, the fourth by resuture of the uterine scar. All the mothers survived.

Rupture Occurring in Hospital.—The first case was one of transverse presentation. Decapitation was done and the uterus was then found to be

ruptured. In the second case labour was medicinally induced, and after ten hours of strong labour the uterus ruptured, the baby weighing 4.7 kilograms (ten and a half pounds). The next case was similar, in that medicinal induction was also used, but after fourteen hours of labour disproportion was recognized and section decided on. On opening the abdomen, however, the uterus was seen to split, with ragged edges in the line of the abdominal incision. In these last two cases the medicinal induction was probably a factor causing the rupture, though in one case twenty-four hours and in the other seven hours had elapsed since the termination of the treatment. In the fourth case, that of an 11 *para* without disproportion, rupture occurred spontaneously two hours after the patient's admission to hospital and eleven hours after the onset of labour. Hysterectomy was used, two mothers dying and two surviving.

The maternal mortality in all the cases of ruptured uterus amounted to 50%. The patients who survived were those in whom no attempts at delivery had been made and in whom operation was performed soon after the rupture had taken place.

Other Abdominal Deliveries.

One patient, a two *para*, had a transverse presentation with a contraction ring. A leg was amputated and then, great difficulty being anticipated, hysterectomy was done without opening the uterus. The mother died with a pelvic abscess nine days later.

The other patient, a nine *para*, had a full term ectopic pregnancy and survived.⁽¹⁰⁾

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RETAINED TRACHEOTOMY TUBE.

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AFTER the operation of either intubation or tracheotomy in children one occasionally meets with

patients who find it difficult or impossible to breathe satisfactorily when an attempt is made to discard the tube permanently. Many of these patients have to wear a tracheotomy tube permanently. Some of them die from asphyxia, owing to blocking of the tube or to delay in the reinsertion of an intubation tube which has been accidentally expelled. The French call people who wear permanent tracheotomy tubes, *canulars*. Some authorities assert that the wearing of a tracheotomy tube permanently does not interfere in any way with the health of an individual and does not restrict his activities much. They assert that swimming is about the only sport in which he cannot indulge. It is true that there have been *canulars* who have lived to a good old age. St Clair Thomson⁽¹⁾ mentions the case of an old lady of eighty-seven, who wore a tube for seventy years, had seven children, and had never suffered from bronchitis. He mentions another patient who died from senile decay at eighty-one years of age, after he had been wearing a tube for fifty years. However, neither of these patients had been wearing the tubes from infancy or young childhood. The wearing of a permanent tube from childhood must interfere with development. The mere fact that the air breathed is neither warmed nor filtered before passing into the lungs must of necessity be a great disadvantage to the town dweller. Moreover, the larynx will fail to develop and its intrinsic musculature will atrophy if not used, which, of course, is not a great calamity if it is never going to be used; but one should not allow the larynx to become permanently stenosed if it can be prevented. *Canulars*, moreover, must develop an inferiority complex. We know that horses, the so-called whistlers, have been known to win races wearing permanent tracheotomy tubes. In spite of all this, we must all agree that every effort must be made to prevent children who have been unfortunate enough to have had to wear a tracheotomy tube for a time from being condemned to the wearing of such a tube for the rest of their lives. And even if we have to condemn the child to the use of a permanent tracheotomy tube, there is no reason why he should not wear another small tube, which I will describe later, so that he will be able to breathe through the mouth and develop the power of speech, even though wearing a permanent tube.

The longer the child has been wearing a tracheotomy or intubation tube, the more difficult does its permanent removal become. But cases have been recorded in which children, after having worn tubes for several years, have been successfully treated, so that they have been able to carry on satisfactorily without their tubes. It is difficult to say which operation, intubation or tracheotomy, has been responsible for the greater number of *canulars*. Generally, when intubation has been the original operation, tracheotomy has been done later, as the wearing of a permanent intubation tube would not be possible. In any case the operation which has been too hastily, and generally unskillfully, performed is responsible for the trouble. The intuba-

tion tube may have been too large, or it may have been clumsily inserted. A well fitting and skilfully inserted tube would hardly be likely to cause any subsequent damage. When tracheotomy has been the original operation the fault has generally been the making of too high an incision; possibly the cricoid cartilage has been divided, or the incision has been made too close to the sensitive subglottic larynx. The low operation is less likely to be followed by trouble, but this operation is a little more difficult to perform, as the trachea lies at a deeper level and comes into relation with more important structures low down than high up. The length of the trachea above the sternum is not so great as would at first appear. The average full distance, even after extension of the head, in a child of between three and five years is only about 3.75 centimetres (one and a half inches). This distance increases slightly with age, and in children of eight to ten years it is about 5.6 centimetres (two and a quarter inches). Then again, the tracheotomy tube used may be too large and so cause ulceration from pressure. Hence neither intubation nor tracheotomy, correctly and skilfully performed, will be likely to be followed by stenosis of the larynx or trachea. These are the operations, however, that are necessarily hastily performed in certain cases, seeing that they are frequently done on patients *in extremis*.

Causes of Dyspnoea after Removal of Intubation or Tracheotomy Tube.

Causes of dyspnoea after removal of an intubation or tracheotomy tube may be enumerated as follows:

1. The tube is removed before the membrane has separated or before the inflammatory swelling has subsided. The child may expel the tube after coughing or vomiting soon after its insertion. In some cases sufficient membrane may be dislodged at the same time to give relief and the tube may not require reinsertion.

2. Adductor spasm of nervous origin. In many cases the dyspnoea following removal of the tube is of nervous origin. The child misses the tube and dreads a recurrence of the dyspnoea which was relieved by the operation. There may be an adductor spasm, causing an inspiratory stridor brought on by fear. In such cases much can be done by a tactful nurse to alleviate the child's distress. Sedatives also can be administered before the tube is removed and for a short time afterwards. Several patients have been admitted to the Children's Hospital in recent years who had been wearing tracheotomy tubes for many months and who required no other treatment than removal of the tube and close observation and care by a tactful nurse.

3. Oedema of the glottis or of the sensitive subglottic larynx. In this case the use of a smaller tube or, if a smaller tube will not stay in, the larynx should be rested by doing a tracheotomy if intubation has been the original operation, or if a high tracheotomy has been the cause it might be advisable

to do a low operation and allow the high incision to heal.

4. The presence of granulations following ulceration caused by the irritation of too large a tube. The granulations sometimes take the form of a polypus which may obstruct the trachea just above the level of the tracheotomy tube. These granulations may be gently curetted away and the surface of the ulcer painted with weak silver nitrate solution.

5. Cicatricial stenosis following the healing of an ulcer. Sometimes the ulceration occurs in the larynx which may be almost obliterated by the resulting stenosis. These cases may be dealt with by gradual dilatation, as by passing graduated bougies from above or by using a specially shaped intubation tube with the bulge near the lower end instead of near the middle.

6. A submucous fibrosis has been described as being not unusual after intubation. Extensive fibrous tissue formation occurs between the mucous membrane and the cartilage, owing to the loose attachment of the former. Extensive operations have been done in these cases. The fibrous tissue has been dissected away after doing laryngo-fissure and after dissecting up the mucous membrane.

7. Pretracheal or prelaryngeal abscess. Some time ago a number of children admitted to the Royal Alexandra Hospital for Children developed abscesses around the trachea or in front of the larynx a few days after intubation had been performed. Generally these abscesses did not cause dyspnoea, but in one or two instances they did, and the dyspnoea in these cases was relieved on opening the abscess. The cause of these abscesses was difficult to determine. Most of them occurred during the course of a few weeks and the intubations had mostly been done by the same man. They evidently followed some infection resulting from an abrasion of the mucous membrane of the larynx.

Use of a specially designed intubation tube, either alone or in conjunction with a tracheotomy tube, in cases of dyspnoea following extubation or removal of a tracheotomy tube.

In several cases recently I have used a special form of tube in certain of the conditions described above, and as it has proved very satisfactory I cannot do better than quote some of the cases in which it has been of service.

The apparatus itself was described by me in *The Australian and New Zealand Journal of Surgery*, April, 1933, page 423. The principal part consists of a small intubation tube from which the expanded upper end has been removed, leaving the tube about 3.1 centimetres (one and a quarter inches) long. This is inserted through the tracheotomy wound by means of a small handle which is fixed near the lower end. The tube extends upwards to a level just below the vocal cords, and downwards to a point just below the tracheal wound. The tube is left in position for from two to three weeks, during which time the tracheotomy wound heals up until only the small handle projects through the skin.

The tube is then removed, after enlarging the opening, by inserting a tenotomy knife and cutting downwards until the tube can be tilted outwards, thus freeing the lower end first.

One advantage in using this tube is that the child does not miss its removal as much as is the case after the removal of an intubation or tracheotomy tube. Whilst the tube is in position the child is breathing more or less normally through the larynx and, if the tube is removed under anaesthesia, after it regains consciousness it is not aware that anything has been removed. This device therefore is particularly useful in cases of dyspnoea of nervous origin; and in cases of stenosis due to granulation tissue the pressure of the tube will cause its absorption. I have used this same tube also in a patient who has to wear a permanent tracheotomy tube, by inserting it first through the tracheotomy incision and then inserting the tracheotomy tube below it. The tracheotomy tube is perforated at a point where the lower end of the short tube impinges against it, so that on blocking the air entrance of the tracheotomy tube the child breathes through the mouth and, as the tube ends just below the level of the vocal cords, phonation is not interfered with.

Illustrative Cases.

I shall quote several cases in which this device has been used successfully, and other cases illustrating some of the features described above.

CASE I.—J.N., aged two and a half years, had tracheotomy performed when eight months old for laryngeal diphtheria. The high operation had been hastily performed. She had been in hospital, wearing the tube, since operation, that is nearly two years. A number of attempts had been made to discard the tube, and under anaesthesia on one occasion a catheter had been passed into the trachea through the larynx. She was admitted to the Children's Hospital on February 14, 1933, and the special tube described above was inserted in place of the tracheotomy tube. This was left in for three weeks; the tracheotomy incision thereupon healed, leaving the small handle projecting through the skin. The small tube was removed in the manner described above and the wound was closed with a gauze pad and strapping. The child had some stridor for about a week and left hospital speaking and breathing normally several weeks later.

CASE II.—E.G., aged two years, was admitted to the Children's Hospital on November 15, 1932. Tracheotomy had been performed for diphtheria three months before admission and the child had been wearing a tracheotomy tube ever since. On admission to hospital the small special tube described above was inserted and after being in position for one week it was removed under anaesthesia. The child was kept in a drowsy condition for several days with sedatives and gave no further trouble. She left hospital two weeks after commencement of treatment.

CASE III.—B.K., aged six and a half years, was admitted to the Children's Hospital three years ago and has been in hospital ever since. When three and a half years old she had been treated in the country for laryngeal diphtheria. The attack was evidently a very severe one and her larynx was first intubated, and eight days later a tracheotomy was performed because she was unable to do without the intubation tube. After she had worn the tracheotomy tube for three months an attempt was made to reinsert the intubation tube, but it was found to be impossible to get it in, as the larynx had become stenosed. The child was thereupon sent into the Children's Hospital and another attempt was made to insert an intubation tube, but this also failed. Dr. Alexander Dunn examined the child and found that the larynx was completely

stenosed; the vocal cords were fused together in the middle line. Under direct laryngoscopy Dr. Dunn made a small opening between the cords with a tenotomy knife and left a few strands of fishing gut through the opening. Later on he gradually dilated this opening with bougies and later on again a small intubation tube was inserted. The intubation tube, however, gave a lot of trouble, as the child could not retain it for long, and she rapidly became distressed after coughing it out. It was thereupon decided to allow her to carry on with a tracheotomy tube.

She was referred to me in May, 1930. The subglottic portion of the larynx and portion of the trachea above the intubation tube had become stenosed. This was opened up and a long intubation tube was inserted from above. The intubation tube used was specially constructed. A hole had been made in the tube in such a position that when the tube was in place the opening was opposite the tracheotomy wound, so that a small lateral tube could be fitted into the main intubation tube after the latter had been inserted. The end of the lateral tube was closed by a removable cap. The child wore this tube for several months, but it proved unsatisfactory on account of the difficulty experienced when attempting to insert the side-piece into the main tube. I thereupon adopted the device



Skiagram showing special intubation tube and tracheotomy tube in position in child B.K.

which she is now wearing. First, a small intubation tube similar to those used in the cases just described is inserted through the tracheotomy incision, but in an upward direction, and then an ordinary tracheotomy tube is inserted below it. The tracheotomy tube has a small opening where the lower end of the special intubation tube impinges against it, and by closing the external opening of the tracheotomy tube the child breathes through the mouth; and if the intubation tube gets blocked at any time the plug can be removed from the tracheotomy tube. Since wearing these tubes the child is learning to phonate, but owing to the extensive damage done to the cords her elocution is a long way from satisfactory yet. It is, however, a great improvement on the whispering voice of the ordinary *canalard*. Moreover, she is a mouth breather and is in excellent health. I am in hopes that by using larger and larger tubes she will eventually be able to dispense with all the tubes. At present she can remove and reinsert both tubes herself without assistance and can do this in her own home, so that there is no necessity for her to remain in hospital. The accompanying illustration shows the tube in position.

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ALLERGY IN OTO-RHINO-LARYNGOLOGICAL PRACTICE.¹

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It is commonly believed by the public that once one has had a nasal operation performed a whole series of such operations will follow. Unfortunately there is quite a modicum of truth in this belief.

Multiple operations in nasal disease may be necessary because of: (i) the multiplicity of lesions or (ii) the overlooking of some other cause for the nasal symptoms, such as allergy. Multiplicity of lesions may have been recognized by the surgeon, but he may perform one operation at a time in the hope that he may, by curing the main lesion, cure the others; or he may wish to do certain of the operations (such as septum resections) under local anaesthesia and others (such as radical antrum operations or tonsillectomies) under general anaesthesia. On the whole, however, it will be found that better and quicker results will be obtained where multiple lesions, as far as possible, are dealt with together. It is extraordinary how frequently such concomitant lesions exist. In antral infections it is rare, except in those of dental origin, that a bilateral infection of some degree does not exist and that, if operation is required on one side, a bilateral operation would not be better practice.

General causes of nasal disease, such as dusty occupations, working in chemical fumes (as galvanizers do), endocrine disturbances *et cetera*, are not so frequently overlooked as are allergic phenomena. As will be shown, these may be difficult or at times impossible to detect by the ordinary means of examination used by the oto-rhino-laryngologist, but more often the overlooking of such a cause is due to the fact that the surgeon does not appreciate the significance of symptoms presented by the patient.

Diagnosis of Allergies.

Certain allergic diseases, such as hay fever, are scarcely ever overlooked. A seasonal incidence with attacks of sneezing accompanied by attacks of copious watery rhinorrhoea are pathognomonic. Similar non-seasonal conditions may be labelled vasomotor rhinitis, but their relationship to allergy is not always recognized.

The association of any condition with asthma would naturally make one carefully consider whether any nasal symptoms could be allergic, but many patients with mild asthma do not know it, and every patient whose nasal symptoms may be caused by allergy should be asked if there is any

tight feeling in the chest or dyspnoea at night, or any wheezing or frequent bronchitis. If wheezing with bronchitis is present one should inquire whether the wheezing will come on at once in an attack of bronchitis or only after the bronchitis has been present for several days. A family history of asthma or hay fever should also be investigated. By a few questions such as these one can often establish that what has been looked upon and treated for years as bronchitis is really an allergic phenomenon.

On examining the nose within a few days of a nasal allergic attack the mucosa presents an almost pathognomonic appearance. It is a pale bluish or whitish colour, not easily described, whilst it has a consistency varying from a faint boggy up to well developed polyp.

Polypoid sinusitis is always suggestive, especially when a number of sinuses are definitely involved and when little evidence of suppuration is present. Itching of the eyes, nose or palate, coming in attacks, is also frequently due to allergy.⁽¹⁾

Much stress has been laid on the diagnosis from the finding in the nasal secretion of large numbers of eosinophile cells.⁽²⁾⁽³⁾ However, in practice one finds that when a secondary infection is present, the number of eosinophile cells is not so obvious as in a primary infection. Also eosinophile cells in the nasal discharge are not easily stained, whilst the granules of the polymorphonuclear cells in the discharge stain so much better than those in blood films that differentiation is not easy. The absence of pus cells from a nasal discharge is also suggestive, though the presence of pus cells does not exclude allergy complicated by infection.⁽⁴⁾

Before going to the trouble of a detailed skin reaction investigation there is a simple test of the urine which will help one to decide that the symptoms are allergic. Oriel and Barbour⁽⁵⁾ found that in allergic patients, if a specimen of urine is acidified to Congo red paper by sulphuric acid and then agitated with one-fifth of its volume of ether, after it has been allowed to stand there collects on the surface of the urine, in the form of a gelatinous plug, a substance which they suggest is a proteose. In well marked cases the test tube can be inverted without the urine being spilt. Mild reactions will be found in those apparently healthy, but a marked reaction is strongly suggestive of allergy. There has been much discussion on the nature of this substance and its significance, but in spite of adverse criticism it appears to be useful in diagnosis. Finally, the patient can have the dermal reactions performed for sensitiveness to proteins.

Allergens Responsible.

Patients whose symptoms have a definite seasonal incidence are nearly always sensitive to a pollen, and as a group these are the best to treat.

The majority of patients with nasal allergic symptoms are sensitive to a dust, but some are sensitive to foods *et cetera*, the allergen being able to reach the nasal mucosa via the circulatory

¹ Read at a meeting of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association on August 29, 1934.

system. This is proved by the fact that when a local reaction is obtained by an intradermal test injection the patient sometimes at the same time complains of an itchy nose and gets an attack of sneezing until the local reaction has been controlled by adrenaline.

Patients also may be sensitive to toxins of organisms. When the organisms are in the nose or sinuses this introduces special difficulties in diagnosis and treatment, which will be dealt with later.

Relationship of Nasal Disease to Asthma.

It is a time-honoured piece of information that asthma can be cured by nasal operations. It is also true that the condition of most patients with asthma is improved for a short time by any nasal operations the reaction from which happens temporarily to increase the nasal obstruction, and it is equally true that the permanent cures from such treatment are few and far between.

Complicated theories of reflexes from the nose to the lungs have been worked out, and we are told of cases in which patients with cat or flower allergy have an attack at the sight of a cat or of an artificial copy of the flower involved. Certainly it may be possible for hysteria to simulate a true attack, but probably the only true relationship between nasal symptoms and asthma is that they are both due to a common cause. When such a cause is dust it is reasonable to expect the asthma to be improved when a nasal operation produces enough increased temporary obstruction to prevent the usual amount of dust from reaching the bronchi. Asthma can also arise from a patient becoming allergic to the toxins of the organisms in an infective nasal lesion, and in these cases the asthma may be benefited or cured by treatment of the nasal lesion. This probably explains those cases in which decreasing the nasal obstruction, for example, by removal of polypi, mitigates the asthma.

Relationship of Nasal Lesions to Hay Fever.

Mechanical stimulation of the nasal mucosa can produce symptoms similar to hay fever. In many people touching an inferior turbinate with a wisp of dry wool produces lachrymation, intense immediate conjunctival congestion, sneezing, and more or less rhinorrhœa lasting for some minutes. A patient with nasal allergy has similar symptoms when the mucosa is irritated by the substance to which he is sensitive. Sometimes the patient is only slightly sensitive to a substance and the allergen produces only a slight mucosal swelling. It may, however, be sufficient for this swelling to cause an inferior turbinate, for instance, to touch a septal spur, when the added mechanical irritation produces much more violent symptoms. Such a patient might receive great benefit from septum resection, from adjustment of the turbinates or from use of the cautery or from electrolysis of a turbinate. Most of the symptoms of hay fever are reflex, and the reflex can be broken at various

points. By means of a cocaine spray the reflex is stopped at the receptor. Cautery of the mucosa at the points of contact acts in the same way, but the benefits rarely last long unless the allergic irritation is benefited in the meantime. Alcohol injection of the sensory nerves to the nasal mucosa also has its adherents.

That the symptoms of hay fever are largely due to the added mechanical irritation of mucosal contacts is shown by the action of ephedrine and the effect of injecting the sphenopalatine ganglion and ethmoidal nerves with alcohol. In some cases of hay fever the attack is immediately controlled by an ephedrine spray. As this is not a local anæsthetic and as the effects are produced before time for general absorption has elapsed, one must attribute the improvement to shrinkage of the mucosa. Similarly, the physiological severance of the sensory nerves by alcohol not only produces a cessation of the sneezing, but also of the rhinorrhœa and most of the swelling of the mucosa.⁽⁶⁾ In fact, these symptoms can be cured in one nasal fossa by such unilateral treatment. The fact that this treatment so affects these symptoms proves that the rhinorrhœa and most of the œdema are due to the reflex produced by the irritation and are not due to the local action on the mucosa of the allergen.

Although, therefore, it must be admitted that intranasal operations will often greatly benefit or appear to cure patients with nasal allergy, unfortunately it is frequently found that the allergic irritant alone will still be able to produce the reflex, and in cases in which an apparent cure has been produced, should the patient ever become more sensitive to his allergen, his symptoms can recur.

On the other hand, symptoms exactly similar to those of nasal allergy can arise in non-allergic subjects, for example, when an inferior turbinate swells when a person comes from a warm atmosphere into the cold; and these patients can be completely cured by nasal treatment alone.

Relationship of Nasal Polypi and Sinusitis to Allergy.

Sinusitis in cases of nasal allergy is very common. It is in fact uncommon for any case to progress long before X ray examination will reveal definite changes in the mucosa of the sinuses, especially the antra.

The relationship here may be one of the following:

(a) The frequent nasal obstruction of the allergic attacks has produced a secondary nasal infection which causes sinusitis. Here the sinusitis generally clears up when the allergy is treated, but sometimes it may persist, even when the allergy is under control. If, however, operation is undertaken before the allergy is dealt with, the added airway produced may enable more dust to be inspired and the patient is made worse. These are the cases in which sinus operation after sinus operation is performed.

(b) The sinus infection is primary and the patient has become allergic to the organisms present. These patients benefit greatly from sinus drainage with or without vaccine treatment.

(c) The sinus phenomenon is purely allergic. Here the mucous membrane of the sinuses is often very thick and the whole sinus may be filled by a thick mucosa or polypi. Atrophy of the bony walls of the sinus is common in old-standing cases. On lavage the return is clear or contains a mass of mucus often like raw white of egg. Frequently there is considerable resistance to the flow of lavage fluid. Operation on these patients does no good, but treatment of the allergy will allow these greatly altered mucosae to return to normal.

Nasal polypi are often present in cases of nasal allergy. In some of these the size of the polypi vary almost from day to day. Polypi are caused by strangulation of a piece of swollen mucosa which has become extruded from a sinus, and resolution may be impossible even after the irritant which caused the initial swelling has been withdrawn. But here again, unless the allergy is dealt with, even repeated operations will be ineffectual or even detrimental.

Relationship of Sore Throat to Allergy.

Many allergic patients complain of sore throats. The discomfort often lasts only a few hours, but this may be repeated every day, and it is rare for the attacks to last long enough to resemble recurrent tonsillitis, though the sore throat may recur every day for weeks. On examination, if the tonsils are otherwise healthy, the pharynx may appear intensely congested during or after an attack or quite normal at other times.

It will be seen, therefore, that in all oto-rhino-laryngological allergic or suspected allergic diseases it is to the advantage of the patient and a sound working rule to investigate and to treat the allergy first. If symptoms then persist, operative interference can be used with advantage to the patient and without loss of prestige to the practice of oto-rhino-laryngology, though sometimes with loss to the individual oto-rhino-laryngologist. In cases of acute frontal sinusitis secondary to allergic nasal phenomena the sequence may need to be reversed on account of the urgency of the symptoms.

If results under allergic treatment are poor, the patient should be returned to the oto-rhino-laryngologist for a further opinion; and any sinus drainage *et cetera* can then be expected to give far greater satisfaction than if it be carried out before the allergy is treated.

Each case must be treated on its merits. In doubtful cases the risk of putting a patient to an unnecessary allergic investigation and possibly not instituting necessary surgical treatment is to be balanced against the risk of performing an unnecessary operation due to lack of investigation.

Reasons for Many Poor Results in Treatment and Investigation of Allergic Cases.

Test cases of substances for investigating allergic conditions cannot contain all the allergens with which patients come into contact, and many failures come from this cause. Those pretending to investigate a case sometimes try only two or three tests.

Some patients are allergic to so many substances that specific treatment is impossible. However, where the allergens fall into groups, for example, several flowers of the *compositae* family, several grasses, several feathers *et cetera*, satisfactory treatment is often possible by injecting the commoner representatives of each group. Sometimes cases of allergy occur in which the attack takes place only when more than one allergen is present at the same time, and often the patient is only mildly allergic to one of them,⁽⁷⁾ that is, there is a major and a minor allergen, but both are necessary together to produce an attack.

Many failures arise from using stale test solutions, and certain imported test sets consist largely of substances not met with in Australia.

Very numerous failures are due to lack of experience of the investigator; for example, the slightest trace of a reaction to the scratch test should be followed by an intradermal test in order to determine whether the trace of reaction is of importance or not. This point alone has produced dozens of accurate diagnoses with subsequent cure where one failed a few years ago.

The writer most emphatically advises the sending of a patient to an expert for these tests. Performing the tests oneself is tedious, and if the work is done thoroughly is so expensive that even special fees do not cover the material used. Pressure of other work makes it difficult to keep up with the special knowledge involved, for example, the information as to which grasses have heavy pollens which lie so long that they produce non-seasonal allergic symptoms, *et cetera*. The expert allergist, however, buys his allergens in bulk at a price which renders the out-of-pocket expenses negligible, he has trained assistants whose help enables him to rush through a great number of tests in a very short time, and he makes it his business to learn more about the subject than those occasionally performing the tests can ever hope to do.

Conclusions.

1. Nasal allergy is very common and, as it can often produce symptoms not usually associated with it, its presence should be continually in the mind of every oto-rhino-laryngologist.
2. Its presence is especially suggested by attacks of sneezing with watery rhinorrhœa.
3. When allergy is present it should, except in certain cases, be investigated and treated before operative interference is attempted, for such attempts frequently increase the severity of symptoms.
4. Even when a secondary infection does not clear up with allergic treatment, the secondary infection can be dealt with later and no harm will have been done, as these patients do very poorly if operation is done first.
5. The assistance of a trained allergist is strongly advised in the elucidation and treatment of these cases.

6. The whole question of allergy has been and still is treated sceptically by a large body of the profession. This is due largely to the large number of failures in diagnosis and treatment which have occurred. Every few months such failures are becoming fewer, and at present the successes have reached a more encouraging standard. The number of successes depends largely on the allergist treating the patient, for the work is still new enough for the efficiency of different allergists to vary enormously. So much progress is being made that what we consider satisfactory results at present will doubtless, in only a few years hence, look poor by comparison.

Illustrative Cases.

The following is an example of vasomotor rhinitis due to allergy to food, and of good results from treatment where a scratch test gave very slight reaction. Such a reaction would nowadays have been verified by intradermal test.

CASE I.—M.D., a schoolgirl, aged fourteen years, on February 11, 1926, complained of subacute recurrent sore throats, intermittent nasal obstruction associated with attacks of sneezing and watery rhinorrhœa. At the age of three she had had rheumatic fever, and at thirteen she had had rheumatic pericarditis followed by adherent pericardium. She had attacks of intense cyanosis and dyspnoea on slight exertion, and her pulse became imperceptible. On examination there was a marked deflection of the septum to the left, a hypertrophied right inferior turbinate, with greatly hypertrophied tonsils. Tonsillectomy under local anaesthesia was advised, and also investigation of allergy. I performed scratch tests for hairs, feathers, pollens and foods. All gave no reaction, but there was a very faint trace of reaction for almonds. Although this was of a degree that up to that time had been classed as no reaction, she was asked about almonds, as this was the only suggestion of any reaction. She admitted a great fondness for them and that she spent all her pocket money on them. When she adopted an almond-free diet all the asthma and vasomotor rhinitis ceased, but her parents could not be persuaded to allow her to have a tonsillectomy.

The following is an example of: (i) nasal polypi due to nasal allergy and which shrank away with desensitization, (ii) slight reaction to scratch test with marked reaction to intradermal test. The cause would have been overlooked if traces of reaction to the scratch test had not been followed up by intradermal tests.

CASE II.—Miss E.B., aged eighteen years, was referred by Dr. Harker on June 25, 1929, complaining of nasal obstruction with trace of postnasal discharge for five years. For ten years she had been subject to sneezing attacks with never much rhinorrhœa. Nasal obstruction was worse during these attacks. She had slight sore throats, but only with colds. She felt well. She had rare wheezing at night. There was no history of asthma or hay fever in the family. On examination she had well developed polypi in both middle meati. The patient was referred to Dr. Arnold on July 12, 1929; he reported that the patient gave a slight reaction to house dust and to hen and goose feathers. On repetition of the tests intradermally five centimetre (two inch) diameter reactions were obtained. On October 1, 1929, she had had a course of desensitizing injections against house dust and hen and goose feathers. She had no more sneezing, except occasionally whilst dusting the house. She felt better

and had put on weight and the nasal obstruction had cleared up. On examination the nasal polypi had disappeared.

The following is an example of a case in which an allergic cause for the symptoms was almost overlooked on account of the absence of the usual symptoms. An allergic cause was eventually suspected on account of the great improvement in sinusitis during the winter.

CASE III.—Miss H., aged forty years, consulted me on November 12, 1927, having complained for five years of headache at the "root of the nose", of frequent cough and of mild sore throats of short duration. She had never had sneezing, rhinorrhœa or asthma. She had had the nose cauterized six to seven times five years previously. On examination the nose was healthy, but the tonsils were slightly injected and there was a zone of congestion of the pillars. Dr. Vote examined the patient with X rays and reported that the right antrum was dull, with great thickening of the mucosa. Both ethmoids were dull. The patient was advised to have a double radical antrum operation and to have her tonsils dissected. She returned on August 9, 1931, to have this done, but stated that in the interval she had discovered that her symptoms cleared up in the winter but had returned this spring. In order not to overlook an allergic cause, the patient was referred to Dr. Arnold, who reported that the patient was sensitive to several grasses and to cosmos and sunflowers. After a few injections of a suitable mixed allergen vaccine all the patient's symptoms cleared up and no operation has been required.

The following is an example of allergy with secondary infection in which treatment of allergy was followed by transitory improvement for a few days after each injection only, but complete recovery followed only on surgical treatment of the secondary infection. If allergic treatment had not been carried out first the patient might have had operation after operation.

CASE IV.—M.R.B., a clerk, aged twenty-three years, referred by Dr. Harker, complained for two years of continuous obstruction with exacerbations. There had been slight postnasal discharge for two years, with attacks of sneezing and watery rhinorrhœa, accompanied by a gripping sensation at the root of the nose. Colds were frequent, but were of very short duration. The patient felt well otherwise, and had previously had only a temporary traumatic musculospiral nerve palsy. He had never had asthma, and there was no asthma in the family, though an uncle had had hay fever. On examination there was a markedly deflected septum, and masses of lymphoid tissue were present behind the posterior pillars of the fauces. On March 14, 1930, a septum resection was performed and on May 23, 1930, the pharyngeal lymphoid tissue was cauterized. On June 11, 1930, the nasal mucosa was boggy and the patient complained of attacks of sneezing with watery rhinorrhœa. On June 24, 1930, he was referred to Dr. Arnold for protein skin tests; Dr. Arnold reported that the patient was sensitive to goose feathers and house dust. On September 23, 1930, the patient had had a course of desensitizing allergic injections. The airway had improved. He felt better, but after attempts to discontinue the vaccine were made symptoms recurred in about a week. On June 18, 1931, X ray examination was made by Dr. McCaffrey at the Newcastle Hospital. Both antra were dull, the left being dull only on the floor. Both ethmoids were dull. The frontal sinuses and sphenoids appeared clear. On July 29, 1931, a double radical antrum operation was performed. The left antral mucosa was clear, except for a thin-walled cyst on the floor, containing glairy clear fluid with a very offensive odour. Both antral mucosae were stripped. On September 18, 1931, the patient had no symptoms and no sneezing or nasal obstruction had occurred since the operation.

The following is an example of a sneezing-rhinorrhœa reflex due to local nasal causes and cured by resection of the septum.

CASE V.—G.A., aged sixty-six years, was referred by Dr. Annetta. On April 23, 1928, he complained of intermittent nasal obstruction that was worse at night and that had been present for twenty years. He had had sneezing with moderate anterior nasal discharge during attacks for four years. He had no sore throats. He had headaches for one week only. He was a moulder and found that the graphite powder used at his work easily induced sneezing. On examination there was firm contact of a high deflection of the septum against the right middle turbinate. On April 24, 1928, the patient was referred to Dr. Arnold, who reported that the patient gave no reaction to allergic tests. On September 14, 1928, a resection of the septum with amputation of the anterior ends of the middle turbinates was performed. On November 4, 1929, the patient reported that all symptoms had cleared up soon after operation.

The following is an example of (i) multiple nasal operations; (ii) a case in which allergy was the cause of the symptoms, but nothing in the history suggested this until (iii) the number of sinuses affected suggested allergic investigation.

CASE VI.—A.C.T., aged thirty-two years, was referred by Dr. Lamb on May 3, 1928, complaining of hoarseness and loss of smell for one month, with several years of intermittent nasal obstruction, postnasal pus, and of bilateral frontal and occipital headache for four weeks. The patient had frequent sore throats until the tonsils had been removed three years before. There was no sneezing, watery rhinorrhœa or asthma. Dr. Shellshear reported that an X ray examination showed that both antra were dull, especially the right. Both frontal sinuses were clear. On May 10, 1928, antrum puncture and lavage produced shreds of muco-pus from each side. On September 16, 1929, a double radical antrum operation and septum resection were performed. The mucosa was thick, oedematous and congested. The antra were curetted. On January 10, 1930, the patient still had headaches and two ounces of post-nasal discharge every day. Mucus was still obtainable on antral lavage. On January 17, 1930, X ray examination was carried out at Newcastle Hospital by Dr. Fetherston. The sphenoids were large and moderately symmetrical and dull. On February 12, 1930, operation was performed. The anterior walls of the sphenoidal sinuses were removed. Polypoid mucosa was observed in the sinuses, but they were not curetted. On March 3, 1930, zinc ionization of the nasal fossæ was carried out. On October 10, 1930, the patient had begun to have watery rhinorrhœa and sneezing. No more headache had occurred since the sphenoid operation. On November 14, 1930, the patient was having many colds. Dr. Byrne examined a nasal smear and prepared an autogenous vaccine containing *Streptococcus longus* and *intermedius* and *Micrococcus catarrhalis*. On December 25, 1930, the patient had had a course of vaccine. He had fewer colds. On May 20, 1931, his headache had returned for six months; it was present in the right frontal region. On September 7, 1931, the patient had a typical right frontal sinusitis with frontal pain, lasting from 10 a.m. to the afternoon daily. Pus was seen coming from most of the nasal sinuses. The patient was very miserable. X ray examination was carried out at the Newcastle Hospital and Dr. McCaffrey reported that the right frontal sinus was definitely dull. The right ethmoid was dull and both sphenoids and antra were duller than one would expect, even after radical operation. On September 18, 1931, the patient was referred to Dr. Arnold, who reported that he was sensitive to a number of substances, especially several grasses, pea *et cetera*, but chiefly house dust. On November 25, 1931, the patient had had twelve injections of house dust. Vasomotor attacks had almost disappeared and the purulent discharge had greatly diminished.

The following is an example of: (i) multiple polypoid sinusitis due to hypersensitivity to milk, (ii) about eighteen previous nasal operations, (iii) a cure by specific therapy.

CASE VII.—V.A.B., aged fifty-one years, was referred by Dr. Halliday on August 25, 1932. He complained of nasal obstruction, sneezing, with copious watery rhinorrhœa of eight to ten years' duration. He had had eighteen operations by various ear, nose and throat consultants; these included turbinectomies, double radical antrum operations, removal of polypi *et cetera*.

On examination masses of polypi were seen under the stumps of both middle turbinate bones. There was considerable operative destruction of intranasal structures. Both radical antrum openings were patent.

Before further operative treatment was advised the patient was referred to Dr. Arnold for allergic investigation. He reported a small but definite reaction to milk. On a short course of milk-free diet the patient's nasal obstruction and rhinorrhœa subsided and a course of milk injections was instituted. On November 14, 1933, he reported that he had had no symptoms since the treatment was commenced. He had very wide nasal fossæ, the result of his many operations, but the mucosa was now quite healthy.

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Reports of Cases.

PROOF OF PATERNITY.

By J. V. DUHIG, M.B. (Sydney),
Brisbane.

In reporting on the result of blood grouping tests for paternity the serologist puts his report in the form: Mr. X is not the father of Y's child, or Mr. X cannot be excluded as being the father of Y's child; that is to say that the test enables us to say that a man is definitely not the father of a given child, or may be, but is not necessarily, the father of the child. One can prove non-paternity, but must in nearly all cases leave open the question of positive paternity. I wish now to report a case in which the question of positive paternity was so nearly certain that the case could be regarded as decided.

Mr. A. consulted me as to his relationship to three children reputed to be his. He turned out to belong to Group B, and all three children were also Group B. According to Tebbutt, Group B forms about 7% of the white Australian population, so that the chances of getting four Group B persons in a row from a random sample are very remote, apart from the operation of some factor which will take the grouping out of the influence of the

operation of pure chance; this factor is, of course, blood relationship of father-child type, there being no other possible factor.

The proportion of Group B persons in the population is the same as that of the aces in a pack of cards, approximately, and the chance of picking aces in succession in four picks, and four picks only, from a shuffled pack is 1 in 270,750, so remote in fact that I advised Mr. A. to regard himself as the father of the three children in question.

TONSILS REMOVED AFTER DIATHERMY TREATMENT.

By R. H. BETTINGTON, B.A., B.M., B.Ch. (Oxon),
Assistant Honorary Surgeon, Ear, Nose and Throat Department, Prince Henry Hospital; Honorary Ear, Nose and Throat Surgeon, Ryde Memorial Hospital; Clinical Assistant, Ear, Nose and Throat Department, Royal Prince Alfred Hospital, Sydney.

The accompanying photographs illustrate a pair of large tonsils removed after diathermy treatment.

The history of the case is as follows:

Recurring sore throats for some years, increasing in frequency and severity. Some months prior to operation the patient had five diathermy treatments to each tonsil, with intense sore throat after each treatment, and one



FIGURE I. Front view.

severe hæmorrhage from the left side, which, according to the patient, required ligature and incapacitated him from work for three days.



FIGURE II. Back view.

After five treatments he says he was assured that his tonsils were completely destroyed, but his sore throats continued; in fact, he says they were worse.

On examination the tonsil surfaces were flush with the anterior pillars, but gentle pressure in front of the pillar demonstrated the fact that a large portion of each tonsil was still present.



FIGURE III. Side view.

I publish this case to show how hard it can be even for the experienced man to say when a tonsil has been destroyed by diathermy, and also that quite severe hæmorrhage can take place after treatment.

NON-DEVELOPMENT OF RECTUM AND ANUS.

By BERTRAND A. COOK, M.B., Ch.M. (Sydney),
Boorowa, New South Wales.

BABY P. was born at 9 p.m. on September 16, 1934. It was a difficult instrumental delivery without perineal tears or injury to the baby. The child weighed 4.0 kilograms (nine pounds) and appeared normal until examination of the perineum revealed an entire absence of the anus or natal cleft. There was no "dimple" or eminence to mark the site, and the skin was carried in a continuous plane on to the scrotum and penis, both of which were normal. After thirty-six hours I decided to do a laparotomy to determine the exact termination of the gastro-intestinal canal and to make an attempt to prevent acute obstructive symptoms developing. Accordingly, under chloroform-ether anaesthesia an incision was made in the left iliac region, the aim being to split the outer fibres of the rectus, hoping that some sphincteric control might ultimately develop around the colostomy. On opening the abdomen the peritoneal cavity was found full of heavy, dark-coloured fluid; this was aspirated and the descending colon was traced downwards until it was found to end blindly in the pelvic colon-rectal juncture. The bowel above this level for 15.0 centimetres (six inches) was oedematous and congested, but was judged to be viable. A loop of the lower end of the descending colon was brought out of the wound and a mattress suture of silk was passed through the skin muscles and peritoneum on one side, through the mesentery and outwards, and was tied after passing through the peritoneum, muscles and skin of the other side. A temporary colostomy was made and a tube was sutured in by a purse-string suture. The child was not shocked and did not even vomit, and after being fed hourly for twenty-four hours with an ounce of one in eight condensed milk it was taken back to the obstetric hospital, about a quarter of a mile from the general hospital. It immediately took the breast, and twenty-four hours after the operation it was passing normal motions. The rubber tube was removed twenty-four hours after the operation, because it seemed to be obstructing the passage of faeces.

One week after the original operation the same anaesthetic was employed and a permanent colostomy was made after resection of about 7.5 centimetres (three inches) of bowel, and an opening was left into the distal colon to allow any meconium that might have remained to drain

away. The child was again taken back to its mother and immediately took the breast. Its progress has been satisfactory and it is gaining weight.

Discussion.

A number of points are noteworthy. Obviously in this case there has been no development of the post-allantoic gut and proctodeum. It is a useless procedure in a case like this to do a perineal dissection, hoping to find merely a thin barrier separating the post-allantoic from the proctodeum development, whilst to resect the coccyx *et cetera* and to make a colostomy in that region when it is found that there are no sphincter muscles is to leave an artificial anus in a region where it cannot be attended to by the patient. Besides, such a procedure appears to inflict a longer operation on a very delicate subject, and it would appear that to give a child thirty-six hours old the best chance of life a quick relief with the minimum of shock is indicated. Such were the principles kept in mind, and they appear to have been justified.

Post Scriptum.

Seen two months after operation, the baby has gained 0.9 kilogram (two pounds) in weight. The mother says that it has as good control over its bowel as any of the other children have had. Indeed, she ventured to say that it had better control in a way, because it had only two motions a day, morning and evening; certainly on examination the rectus muscles seem to be exercising a sphincter action, and it will be interesting to see whether this is further developed as time goes on.

PARTIAL EXOMPHALOS IN AN INFANT.

By P. L. HIPSLEY, M.D. (Sydney), F.R.A.C.S.,

Honorary Surgeon, Royal Alexandra Hospital for Children, Camperdown; Lecturer in Surgical Diseases of Children, University of Sydney.

BABY C., a male, delivered after Cæsarean section by Dr. Constance D'Arcy at the Royal Hospital for Women, Paddington, on March 27, 1934. A swelling about the size of a walnut was noticed at the umbilical end of the cord. The child had passed a normal amount of meconium soon after birth and had had no vomiting or other symptoms of intestinal obstruction. The condition was obviously a partial exomphalos, and through the thin wall of the sac one could see and feel the contents, which were firm, of a reddish brown colour, and did not in any way resemble bowel.

Under anaesthesia the sac was opened and the caecum, appendix and several inches of ileum were found. These were slightly oedematous and, as the neck of the sac was only about one-quarter of an inch in diameter, it had to be enlarged before the bowel could be returned into the abdominal cavity. The child made an uneventful recovery.

Comment.

It was surprising that several inches of bowel, including caecum and appendix, could occupy such a small sac. An interesting feature of the case also was that the infant passed a normal amount of meconium in spite of the fact that there must have been complete obstruction of the bowel for some time before birth. The main interest of the case, however, lies in the contents of the sac. During the early weeks of embryonic life the liver and mid-gut loop grow too rapidly to be accommodated within the foetal abdomen, hence they remain for a time within the umbilical celom, within the umbilical end of the cord. At the tenth week the mid-gut loop passes into the abdominal cavity and the passage takes place in such a manner that the ileum precedes the caecum. In the case reported the aperture in the abdominal wall evidently

became too small, thus preventing the caecum and neighbouring bowel from entering the abdomen.

This case therefore supports the commonly accepted belief as to the manner in which the mid-gut loop finally passes into the abdominal cavity.

Reviews.

EYE CONDITIONS AND ULTRA-VIOLET LIGHT.

Dr. F. W. Law has had rare opportunities for studying the influence of the various forms of radiant energy on ocular diseases, and his recent book, "Ultra-Violet Therapy in Eye Disease", shows what excellent use he has made of them.¹ In a clear manner and with obvious sincerity he sets out not only the manner in which he has treated a great variety of diseases of the ocular tissues, but also the results that he has observed. He compares his findings with those of previous workers, and reference to their writings is facilitated by the addition of a carefully chosen bibliography at the end of the volume.

So much enthusiasm has been displayed by men who have specialized in one or more of many new methods of treatment, that the clinician is either afraid to use any of them or is apt to apply imperfectly the technique of one enthusiast to an ill-chosen series of patients. Sir Stewart Duke-Elder writes in the foreword to this book:

There can be no doubt that when ultra-violet was widely introduced as a method of therapy some years ago, it was boomed far beyond the limits of scientific rectitude in many quarters, with the natural consequence that before long disappointing results began to be reported. It is undoubted that such an introduction does immensely more harm than good to a therapeutic agent which in its own province is as potent for good as out of its province it is potent for harm. Especially is this true when dealing with an organ of the delicacy of the eye, and one in which the transparency of many of the tissues allows radiation to enter so freely. The same swing of the pendulum is evident in the prevailing opinion of the value of the shorter radiations of radium and X rays. Such a state of affairs is, of course, most unsatisfactory; it is only on patient scientific work and on the careful correlation of large numbers of adequately controlled cases that any pragmatic conclusion can legitimately be based. This is the great value of a monograph such as the present; for with his experience and his industry the author has acquired the right to speak with authority on a subject which too many have approached lightly and without due preparation.

In the introduction the author describes the nature of the four types of radiant energy: radium rays, X rays, ultra-violet rays and infra-red rays, and the known effects of each on the ocular tissues. The remainder of the book is devoted to the therapeutic actions of these rays in ophthalmic practice.

A consideration of the method of application and of the results obtained by each form of radiation occupies one chapter. Of these the largest is that which deals with ultra-violet rays, applied generally in the form of light baths and locally by a specially adapted mercury vapour lamp. At the conclusion of each chapter the author summarizes his views and findings. He shows clearly the valuable adjuncts that are at the disposal of those who with thoroughness make use of radiation in treating ophthalmic disorders. No ophthalmologist can afford to neglect this form of treatment, and no better introduction to it can he get than by a study of this concise, inexpensive, well produced book.

¹ "Ultra-Violet Therapy in Eye Disease, with a Review of the Action of Other Forms of Radiant Energy", by F. W. Law, M.A., M.D., B.Chir., F.R.C.S., with a foreword by S. Duke-Elder, M.A., D.Sc., M.D., Ph.D., F.R.C.S.; 1934. London: John Murray. Demy 8vo., pp. 88. Price: 5s. net.

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CINEMATOGRAPH FILMS IN EDUCATION.

THAT cinematograph films have a profound influence on the thoughts, the imaginations and the lives of many people there can be no doubt. Certain sections of society find in the talking films their sole entertainment, and even the most conservative intellectual has attended, and, though he may not care to own to it, been entertained by the reproduction in sound and picture of one of his favourite masterpieces in literature. All children love picture books, and when they grow old they do not change. Further, most people remember more easily what they see than what they hear. It is therefore not surprising that, somewhat tardily, more is the pity, the picture film is being seriously considered and in some places used as an integral part of educational equipment. The usefulness of picture films in schools is no longer open to question. In what is known as the Middlesex experiment, carried out in England by a joint committee representing educational authorities, teachers and the film trade, it was found that sound films could be used effectively to arouse interest, to teach and to help children to assimilate and revise knowledge. In all,

3,602 children took part in the experiment—2,172 boys and 1,430 girls; and no fewer than 22,118 tests were made. The committee found that sound films could teach definite lessons on school subjects and that they could illustrate lessons more effectively than any other medium. It was not thought that their use would eliminate the personal factor, and the committee saw no reason to fear the results of properly controlled mechanical aids in education. For teaching children the rudiments of biology and of other scientific subjects the picture film is probably best suited. In medical schools and post-graduate classes for medical practitioners also films are in certain respects without rival. Anyone, for example, who has seen the Canti film dealing with cancerous growth and the action of radium on cancer cells has received an impression that will not fade.

Even the most casual observer will realize that the tendency in the film industry is to give people films of the lighter kind, to give them what they think they want. Those who would use films for educational purposes wish to have this changed. In Great Britain the Commission on Educational and Cultural Films began its work three years ago with the general idea that some authoritative coordinating body was needed "to direct cinematography into constructive channels". The commission had no precise conception of what form the body should take. After nearly two years' work they published a report entitled "The Film in National Life". This report was well received by the Press of Great Britain, with the result that the formation of a British Film Institute is assured. Mr. A. C. Cameron, who discusses the subject in the first annual edition of the "Empire Social Hygiene Year Book, 1934",¹ points out that this institute will be the link between producer and consumer and will interpret to the trade the needs, which are rapidly being formulated, of a great variety of organizations wishing to use non-theatrical films—schools, institutions, adult education bodies of all kinds, societies and social organizations. He hopes that on the entertainment side the institute will help a new

¹"Empire Social Hygiene Year Book, 1934", prepared by the British Social Hygiene Council Inc.; First Annual Edition; 1934. London: George Allen and Unwin, Limited. Demy 8vo., pp. 509. Price: 15s. net.

cinema public to demand and to support films possessing, whether as comedy, tragedy, farce or pageant, real dramatic value. He sets out the objects of the institute as follows:

1. To act as a clearing-house for information on all matters affecting films at home and abroad.
2. To influence public opinion to appreciate the value of films as entertainment and instruction.
3. To advise educational and other institutions on the supply, use and exhibition of films.
4. To act as a means of liaison between the trade and cultural and educational interests.
5. To undertake research into the various uses of the film and of allied visual and auditory apparatus.
6. To maintain a national repository of films of permanent value.
7. To catalogue educational and cultural films.
8. To give advice to government departments concerned with films.
9. To certify films as educational, cultural or scientific.
10. To undertake, if required, similar duties in relation to the Empire.
11. To establish branches and local associations to promote the objects of the institute.

This is obviously a movement of which all educational and scientific bodies should take cognizance.

In Australia the use of films for educational purposes is still in its infancy. Leaving on one side the education of children in primary and secondary schools, we have two aspects to consider. The first has to do with the instruction of undergraduates and graduates in medicine, the other with health teaching for the general public. Presumably both these aspects will be covered by the British Film Institute. In accordance with the last of the objects of the institute it is possible that a branch may be established in the Commonwealth. If this were done, it would be a simple matter for medical school authorities and post-graduate committees to arrange for films to be made available in Australia. Films for showing to the public would have to be sought and sponsored by government health departments and by such organizations as those connected with health week. To be effective with the public, films would have to be carefully chosen and the educational aspect should, as far as possible, be camouflaged. Like aperient pills, educational propaganda must be sugar-coated. But that aspect, with many others, may be left for subsequent debate. The three things that need to be remembered at present are that sound films are an effective way

of conveying a message; that an organization, much needed and carefully planned, is being founded in England; and that Australia must be ready to take advantage of what is being done in the Old Country to further education.

Current Comment.

CALCIFICATION IN THE LUNG.

It is one of the disappointments of medicine that an understanding of the processes of disease within the body and even of its mechanism of defence does not necessarily furnish effective weapons by which infections and degenerations may be stayed. For example, we know that the presence of fibrous tissue and of calcium salts in the tuberculous lung is evidence of the defensive capacity of the pulmonary tissue, for the very nature of chronic pulmonary tuberculosis is at once proof of the lung's susceptibility to infection and its power to resist. But when we attempt to reproduce or even to hasten these benign processes of fibrosis and calcification we set ourselves a difficult problem. No convincing degree of general calcium lack may exist in the tuberculous patient, and no therapeutic method which aims at increasing the available calcium has met with conspicuous success. It would seem that in seeking to enhance the immune reactions, we must consider not only the whole body of the affected person, but also the local tissues concerned. R. A. Hunter and Douglas Bell, in undertaking a study of the effects of the introduction of gelatine into the pleural cavity, found that there was a definite production of hyaline connective tissue in the subpleural tissues of experimental animals.¹ They therefore decided to extend the scope of their inquiry to cover the possibility of inducing an artificial deposition of calcium in the lungs of animals. They were led to this work by their interest in gelatino-thorax. Previously, not being impressed with the results of oleo-thorax in cases of tuberculous empyema, Hunter had used a preparation of gelatine combined with acriflavine, and the apparently favourable results obtained induced him to try to discover the *modus operandi*. Accordingly, rabbits were injected by the intrapulmonary route with an attenuated strain of human tubercle bacilli and later with a virulent strain, a procedure which produces a chronic pulmonary lesion not unlike that found in man. If these animals subsequently had the gelatine-acriflavine medium introduced into the pleural cavity, it was found that a considerable degree of hyaline change was produced in the pleural and subpleural tissues. It was not expected that any definite beneficial effect upon the lung lesions would be observed, for the disease thus set up in the rabbit is extremely lethal. But it was decided to add to the medium 5% calcium chloride, in order

¹ *Tubercle*, October, 1934.

that it might possess both antiseptic and calcifying properties. This medium, termed G.A.C.C. by the authors, was injected into the lungs and pleural cavities of the affected animals, and the chief interest of the work lies in the study of the fibrosis and calcification that was thereby produced in the affected parts. It is naturally a difficult matter to inject anything into the pleural cavity of a rabbit with accuracy, and many of the injections thus planned were in fact intrapulmonary, as the staining of the lungs by acriflavine showed. No embarrassment of the animals was ever observed by the treatment, and in the remaining series the G.A.C.C. was injected directly into the lungs. Large quantities were used: for instance, one animal received 82 cubic centimetres of gelatine acriflavine into the pleural cavity and 105 cubic centimetres of G.A.C.C. into the lungs, given in 5 cubic centimetre doses at intervals of two to four days; and before being killed for investigation the animal was still vigorous and in good condition. As many as thirty-eight pulmonary injections were given to a healthy rabbit over a period of seven months. The results of autopsies showed that calcification could be thus produced in a very short space of time; this held good both for healthy and infected animals. The authors conclude that hyaline change in the lung tissue is an essential preliminary to calcification, and that the latter may take place without giant cell formation. A varying amount of fibrous tissue could be found also, and it appeared that this change occurred either independently of lime salt deposits or in association with them. The action of the medium was quite circumscribed and did not spread beyond the area injected. A well-produced series of photomicrographs accompanies this article and illustrates clearly the changes that have been set up in the lungs of these animals. It would be impossible to express a definite opinion on the clinical bearings of this work. But it may be pointed out that in all methods of treatment of pulmonary tuberculosis the medical practitioner seeks to raise the general resistance of the patient and to induce the processes of resolution or of fibrosis and calcification in the lungs. Of the latter the more surgical procedures, such as the various manœuvres designed to bring about collapse, are valuable adjuvants. It is just possible therefore, that the future may see the adoption of some anatomically accurate method of local therapy, such as intrapulmonary injection. At least this research is very stimulating, and further experimental work on the subject would be welcome.

EXOPHTHALMOS.

ONE of the common signs of toxic goitre remains as yet unexplained. Text books copy the same explanations, and no doubt clinical teachers of today give their students the same unsatisfactory causes for this curious phenomenon that they themselves were taught. To say that the intraorbital

fat is increased in amount is no explanation at all, and to invoke a remarkable and sustained degree of activity from the now famous, but quite insignificant, muscle of Müller is not more helpful. Indeed an anatomical inquiry made a few years ago showed that this intraorbital muscle was an inconstant structure and incapable of producing so conspicuous a change in the position of the globe. It is known that exophthalmos is more often seen in young patients, a fact usually associated with the greater lability of the sympathetic nervous system in the young, but it sometimes appears in the middle-aged subjects of nodular goitre. There is also an acute form which adds to the general obscurity of the condition. One curious pathological change that has been observed in the orbital contents is a great increase in the size of the extrinsic eye muscles, which may attain a bulk of eight or ten times their natural size; this may be associated with an actual decrease in the amount of intraorbital fat. Pituitary disturbances have been blamed, and a small *sella turcica* has been observed in a case of progressive exophthalmos. This does not appear to be a very convincing finding, and, moreover, the association of pituitary and other endocrine disturbances with thyroid over-action is recognized. These and other considerations are touched on by H. A. Des Brisay in an article on progressive exophthalmos following thyroidectomy.¹ Des Brisay publishes notes of three cases of this strange condition. It may be remarked that all his patients were over middle life, two being over sixty years of age; they were also all of unstable nervous types, even after partial thyroidectomy had been performed. All three had in addition foci of infection, though the metabolic rates were normal or subnormal. In each case there had been some degree of exophthalmos existing before operation, but no exacerbation of this condition was noticed at once, for a latent period ensued, varying from some months to two years, before the progressive protrusion of the eyes was noticed. On studying the case histories it is very hard to pick out any one feature that suggests a common cause, and the author adds a note that all the patients have improved considerably and have been taking thyroid substance and Lugol's solution. This happy result has not been the good fortune of all patients, for the exophthalmos has in some instances been of a so-called malignant type, causing loss of one or both eyes. Des Brisay, in his review of the literature, reveals that such widely different explanations as hypothyroidism and suprarenal over-activity are given by various authors. Amidst the diverse speculations there is one feature of hyperthyroidism that is important, that is the variability not only of the signs of disease, but of their rate and order of disappearance when recovery takes place. Thus, as hyperthyroidism more or less slowly recedes to a hypothyroid state, all its characteristics do not disappear with equal speed; in this way symptoms of these two apparently conflicting states may

¹ The Canadian Medical Association Journal, October, 1934.

coexist. Bearing this in mind, then, it is not difficult to conceive that the various signs and symptoms observed in hyperthyroidism may not be due to the same cause, and that therefore it is possible for certain signs to disappear whilst others, if not due to the same cause, may actually increase in intensity. This is, of course, mere assumption, but it brings us into line with the views of Plummer, which are quoted by Des Brisay. According to this well known authority there are three agents concerned in Graves's disease: one which increases metabolism, one which produces changes in the nervous system, and one which produces exophthalmos. Des Brisay naturally asks is exophthalmos due to infection or to this unknown factor postulated by Plummer. Since there is a great deal of interest taken in toxic goitre in Australia it seems opportune to draw attention to this unexplained phenomenon, in the hope that some original work may be undertaken on the subject. Certainly the rare case of progressive protrusion of the eyes would seem to provide admirable material for intensive investigation, particularly in the field of metabolic research.

PROGNOSIS IN ARTERIOSCLEROTIC HEART DISEASE.

THE art of diagnosis is difficult, but the art of prognosis is much more difficult. Even if the physician were possessed of all the knowledge that a full anatomical and chemical examination of the patient's tissues could afford, he still would find it far from easy to forecast the tenure of life. But this is the more gloomy side of the picture, for the honest medical practitioner, reconstructing the events in a completed case history, will very often recognize significant finger-posts whose message at the time he did not clearly read. Now everyone knows how hard it is to predict the future of the patient with sclerotic coronary disease, whose symptoms of pain and dyspnoea bring him for advice. In fact it is almost an aphorism that sudden death is well-nigh unpredictable. Yet L. E. Viko, in assembling all available prognostic data in cases of coronary arteriosclerosis, declares that no patient in his series dying of coronary occlusion failed to show significant evidence of the danger that threatened him.¹ This evidence was derived either from a careful study of history and symptoms, from observed physical signs, or from instrumental findings. Of course, as this author remarks, the unpredictability of sudden death from heart disease is probably due more to the failure of the patient to recognize the serious import of his symptoms than his physician's failure to give him correct advice. His epigastric pain is indigestion, his nocturnal dyspnoea is due to "something that has upset him", and so through his optimistic imaginings the advice that might conserve his life may never be given. Viko followed up 153 patients over periods ranging

from one to ten years; half of these died during the period of observation; of those who died, two-thirds suffered either breathlessness or pain, and congestive failure was usually a terminal event. The average length of life from the onset of symptoms in these patients was three to five years; the patients still living averaged a survival period of 4.3 years. But a much more important observation was that anginal pain was the most ominous of the early symptoms, for of those persons experiencing "cardiac pain" as a first symptom, 35% died within six months and 50% within a year. Further, anginal attacks occurring only after exertion did not materially shorten life in the patients studied, whereas angina at rest and coronary occlusion shortened it greatly. No patient suffering from angina while at rest lived more than fifteen months, and half of these died in six months. Paroxysmal dyspnoea of itself was not a specially ominous sign, but in conjunction with pain due to angina or coronary occlusion it was of grave import. These facts are, of course, well known already; the same also may be said of Viko's conclusion that heart sounds and heart murmurs *per se* were of no prognostic help. Similarly neither the actual size of the heart nor the width of the aortic shadow, as seen on fluoroscopy, nor the blood pressure nor the degree of thickening of the peripheral vessels, gave useful information in assessing the patient's expectation of life. The prognostic value of the electrocardiogram is difficult to evaluate, owing to the great variety of changes seen and its variable relation to the degree of cardiac damage. But it was found to be of great value in confirming the diagnosis of cardiac vascular disease, and the most significant changes in the graphs were slurring of the *QRS* complex, inversion of the *T* wave, and anomalies of the *R-T* or *S-T* interval.

There seems, then, to be good reason for this writer's contention that we should not adopt an attitude of undue hopelessness in forming some estimate of the outlook in this form of heart disease. The diagnosis upon which the prognosis depends itself stands on the triad of symptoms, physical signs, and special instrumental methods. Two of these are within the reach of all, and a careful consideration of them will not only serve to select those cases that require more elaborate technical methods of study, but will also go far in making a correct appraisal of the patient's condition. Too much attention cannot be paid to cardio-vascular disease, one of the most sinister enemies of longevity.

CYSTINURIA.

CYSTINE was discovered in 1810 by Wollaston in vesical calculi and was termed by him "cystic oxide". Cystine calculi and cystinuria are infrequently recognized, possibly because they are not often specifically looked for. In 1916 Kretschmer collected 107 cases of cystine lithiasis. Cystine does not exist in healthy urine. It resembles taurine in

¹ The Journal of the American Medical Association, August 25, 1934.

containing much sulphur, the proportion in cystine being more than 25%. Urine which contains cystine is usually feebly acid, often a yellowish-green colour and with a peculiar, sometimes offensive, odour. Cystinuria occurs in persons of either sex and generally between the ages of twenty and forty years; but it may occur at any age, even in childhood. It has been noted in chlorosis. There is a definite hereditary tendency to its appearance. In some cases of cystinuria examination of the urine reveals either a diminution or absence of urea or uric acid. Cystine is recognized by its six-sided or occasionally rhomboidal crystals. These plates are shining and colourless, united by their flat surfaces and overlapping. Cystine calculi have been variously estimated to comprize from 0.26% to 3% of all concretions. They may have a nucleus of uric acid, and seem to be particularly frequent in dogs. Apparently they are more common in England than in Germany. Cystine calculi are mostly smooth, yellow or fawn coloured, and not very hard. They are egg-shaped, with a granular surface glistening with crystals and appearing waxy and translucent. On section a radiating structure is apparent. On exposure they tend to become green. On X ray examination they are relatively invisible and may be quite shadowless, making diagnosis possible only by pyelography.

F. S. Patch records two cases in brothers¹ of cystinuria associated with urinary calculi. He states that cystine is a normal constituent of protein and is found in greatest amount in keratin-containing tissues, such as horn, hoof, feather and hair. It is an amino-acid and is the principal or only sulphur-containing body resulting from hydrolysis of simple protein. It is a necessary component of the diet. In the body the nitrogenous part is largely converted into urea and the sulphur part is mainly oxidized and excreted in the urine as inorganic sulphates. Another pathway is through the biliary constituent taurine. The sulphur in cystine is held in loose combination and is partly evolved as hydrogen sulphide on boiling with alkali. Thus it is distinguished from other amino-acids and the odour arising from decomposed urine with cystine is explained. The urine never contains much cystine.

In cystinuria the liver permits an undue quantity of cystine to escape conversion into urea. At times putrescine, cadaverine and rarely leucine and tyrosine are found, and it is suggested that cystinuria is due to incomplete oxidation of the cystine unit with protein. But Patch considers it doubtful that cystinuria is due to inability of the body to metabolize cystine, since in cystinuria much ingested cystine can be metabolized. A suggestion has been made that the condition is analogous to renal glycosuria. Probably in cystinuria there is a lowered liver threshold for cystine in the blood and there is no relationship between blood concentration and urinary excretion. Estimations of the frequency of cystinuria, based on the demonstration of the crystals in the urine, vary between one in 35,000

and one in 15,000 persons. But by the Brand and Sullivan tests 29 cases were found in 11,000 apparently healthy people. In these tests, however, the colour reaction is not specific for cystine and is given by any compound with the free sulphur-hydrogen group. But, apart from ergothioneine and glutathione, there is probably no appreciable amount of any body in the human organism containing the sulphur-hydrogen group. Consequently the Brand-Sullivan tests are not materially invalidated, and these tests are simpler and more sensitive than the isolation of the hexagonal crystals. Cystinuria, being symptomless, is often overlooked and the presence of cystine in calculi may not be suspected. Cystinuria rarely occurs after the age of fifty years. Patch gives remarkable examples of the hereditary and familial tendency to the disorder. According to Gottstein, 2.5% of cystinurics develop cystine calculi. But calculi in cystinurics may contain little or no cystine. Cystine calculi are possibly more often unilateral than bilateral, and there is a tendency to recurrence on removal. It has been suggested that urinary infection may be important in the formation of such calculi, which, however, may develop in sterile urine, and cystinurics with infected urine may not develop calculi. At all events, urinary infection should be vigorously treated. In the absence of chemical investigation cystine calculi may not be distinguished from those containing uric acid.

Patch is of the opinion that there is no essential difference between lithiasis produced from cystine and that of other materials. Associated with cystine calculi there is some metabolic disturbance; but so also may there be in lithiasis generally. Factors favouring the formation of calculi in general will predispose to cystine calculi. Patch suggests that vitamin deficiency may be a predisposing factor. This may be true; but there seems to be a growing tendency to attribute to vitamin deficiency too many disorders of the human economy without any scientific basis. As regards X ray examination, Patch states that cystine calculi may be quite opaque and that calculi of cystine and phosphates are the densest of all. Evidently radiographers are not in agreement. As regards treatment, most authors advise a low protein diet, but Patch points out that a cystinuric can metabolize cystine readily even when it is given in large amount. As cystine is readily soluble in dilute alkalis, such preparations have been given apparently with success. Claims have also been made of success by treatment with carbonate of ammonium, under the impression that it makes the urine alkaline; this is entirely erroneous. An "alkaline ash" diet has also been used. Patch experienced complete failure in the alkaline treatment, even in the absence of urinary infection. At the best one could expect alkalis merely to dissolve the cystine crystals and leave the underlying cause unaffected. As we have no idea, even yet, what the cause is, treatment can be only empirical and symptomatic. To term cystinuria an "inborn error of metabolism" does not clarify the position.

¹ The Canadian Medical Association Journal, September, 1934.

Abstracts from Current Medical Literature.

PÆDIATRICS.

Rheumatic Disease in Children.

ALBERT D. KAISER (*The Journal of the American Medical Association*, September 22, 1934) discusses the factors influencing rheumatic disease in children. He points out that an investigation of rheumatism can no longer be limited to children presenting well defined symptoms of rheumatic fever, chorea or heart disease, but that other symptoms, such as fatigue, pallor and vague pains may be of great significance and may afford the only evidence of rheumatic infection in the child. One thousand two hundred and forty children were studied and the manifestations noted were grouped as major, such as pericarditis, severe and mild arthritis, chorea, muscular rheumatism, and minor manifestations, such as tonsillitis, fatigue, pallor, epistaxis, abdominal pain. The relationship of the major manifestations to rheumatism is undoubted. In regard to the minor manifestations it may be said that their presence is of considerable importance if one or more occur in conjunction with some of the major manifestations or if a number of them occur in the same child. The optimal age for the first evidence of rheumatic disease was ten years, and girls were more often affected than boys. Rheumatic infection is undoubtedly influenced by seasons, being least common during the summer in all countries. Social or economic factors did not appear to play a significant part in the control of the disease. The potential danger of tonsillitis is stressed. Although rheumatic infection occurs only slightly more often in children whose tonsils are present at the time of the initial attack, the mortality rate is 50% greater in these children than in those whose tonsils have been removed at the time of the first attack. Recrudescences of rheumatic manifestations occur in most instances as the result of infections of the upper respiratory tract. Although some constitutional susceptibility to rheumatism may be assumed, no proof of it is available.

Concentrated Diet in Tuberculosis and Malnutrition.

GERALD E. PRATT (*Archives of Pediatrics*, August, 1934) describes the benefit arising from the use of a concentrated reinforced diet in a group of forty children over a period of three months. Thirty-five of the children gave a positive result to the Mantoux test and the remainder had histories of loss of weight, repeated colds, bronchitis, anorexia, malaise and other suspicious symptoms. Twenty-five were contacts with active tuberculosis. Powdered whole milk, in which the vitamins of the fluid milk are unaffected, except for a slight loss

in vitamin C, and in which there is no appreciable alteration of the other nutritional values of the milk, was used to supplement the daily diet. A pound packet was given to each child per week and could be incorporated in other foods without appreciable effect upon the flavour or bulk. It had the additional advantage of cleanliness, easy digestibility and high nutritive value. All the children thus treated showed general improvements in physical condition, a decrease in the incidence of respiratory tract infections, and there was an average gain in weight of 1.6 kilograms (three and three-quarter pounds).

Treatment for Impetigo Contagiosa.

LESTER HOLLANDER AND JOSEPH J. HECHT (*American Journal of Diseases of Children*, August, 1934) describe a new auxiliary treatment for impetigo contagiosa. They refer to the difficulty which ordinarily arises in controlling the spread of the infection. They aimed at introducing an occlusive dressing which could be easily applied and which did not require the use of adhesive tape to retain it in position. The dressing ultimately selected consisted of metaphen, 1 in 500, in flexile collodion. After preliminary cleansing of the surrounding skin with soap and water and after the skin has been thoroughly dried, several layers of the metaphen-collodion are applied. The layers, which can be easily removed, are taken off in twenty-four hours and several fresh layers are applied, and this process is repeated on the third day. On the fourth day the whole preparation is removed and with it the underlying encrustation. If the surface of the lesion is still moist, the mixture is reapplied for a further three days.

Sinusitis in Children.

ABRAHAM H. PERSKY (*Archives of Pediatrics*, September, 1934) deals with the problem of sinusitis in children. The anatomy, pathology and symptomatology of the condition are briefly referred to and the treatment is considered in detail. From an anatomical viewpoint mention is made of the fact that the frontal sinuses are not recognized as cavities of any size until the seventh to ninth year, and the sphenoid sinus is not fully developed until the sixteenth year. Consequently in dealing with sinusitis in children the ethmoid and maxillary sinuses are the main concern. Acute sinusitis is always part and parcel of an acute rhinitis, the pathological process which involves the nasal mucosa extending through the ostia of the sinuses to involve the mucous membrane of the latter. There is a period of congestion and transudation of serous fluid, which becomes mucopurulent and then purulent. The rapidity of the process is influenced by the virulence of the invading organism, the resistance of the individual, the patency of the nares and ostia, and the frequency of recurrent attacks. The resolution of the

condition is always dependent upon free drainage through the ostia. This drainage may be interfered with by certain physical conditions, such as diseased tonsils and adenoids, deviated septum, or hypertrophied turbinate bones. Apart from mechanical interference, these conditions would also tend to increase the patient's susceptibility to colds. In regard to treatment, the prime factor is "aeration and drainage". The local treatment consists of aspiration of the secretion from the nares by gentle suction and the use of a shrinking lotion, such as 0.5% cocaine hydrochloride with 0.5% ephedrine sulphate solution, followed by further suction and the instillation of a few drops of neo-silvol, argyrol, or menthol and albolene. The last mentioned procedures are carried out with the patient's head in the dependent position. The general treatment consists of a well balanced diet with high carbohydrate intake, fresh vegetables and attention to proper vitamin content. Hematinics and cod liver oil preparations are administered. The use of quartz lamp therapy is advocated, with a warning not to use any local silver preparations in conjunction with it, as argyria may ensue. The author also writes favourably of the use of vaccines, particularly those of the pathogen-select type, in subacute and chronic stages of the disease.

Pleurisy with Effusion.

D. W. SMITHERS (*Archives of Disease in Childhood*, August, 1934) has investigated the subsequent histories of a number of children under fifteen years of age who had pleural effusions. Over a period of twelve years seventy-one such patients were admitted to Saint Thomas's Hospital, but an attempt was made to follow up only those patients in whom the presence of fluid was confirmed by aspiration. Thirty-two patients were actually traced. Of these, two had died of pulmonary tuberculosis, one six years and seven months and the other three years and six months after the effusion. One patient developed tuberculous peritonitis two and a half years after the attack of pleurisy, and another showed signs of spinal caries two years and three months after the effusion. In three there were indefinite signs, but normal skiagrams were obtained and no definite evidence of tuberculosis was present. Twenty-two patients, or 78%, were quite well and had no abnormal chest signs. The author concludes that tuberculosis much less frequently follows pleural effusion in children than in adults.

ORTHOPÆDIC SURGERY.

Delayed Union or Non-Union in Fractures.

R. M. CARTER (*The Journal of Bone and Joint Surgery*, October, 1934) discusses a new method for treating

delayed union or non-union in fractures. The basis of the method was first proposed by Beck, of Kiel, in 1929, and consists of boring a number of small holes through the fragment ends, across the line of fracture. This gives rise to a certain amount of hæmorrhage, allows the penetration of new blood vessels, and furnishes fresh bone pulp, thus creating a stimulus to new bone formation. The author outlines the method by which, through a single skin puncture, six to eight and sometimes more holes can be drilled in a small bone and ten or twelve holes in a larger bone. The more holes which can be drilled, the better. The drill is withdrawn and the same procedure is repeated through a skin puncture on the opposite side of the fracture line. If necessary, one or two additional punctures may also be made. The operation is completed by the application of an unpadded cast, and ambulatory treatment is adopted if the fracture involves the leg. A skiagram taken four to six weeks later will usually reveal definite callus formation. From his limited experience with this method it is the author's opinion that, in those fracture cases with delayed union or non-union for which no cause can be found, which would definitely indicate some other form of treatment, the simplicity and harmlessness of this procedure warrant its trial before open operation is undertaken. When the drilling is properly done the risk of infection is negligible and prolonged hospital confinement is unnecessary.

Experimental Muscular Atrophy.

T. C. THOMPSON (*The Journal of Bone and Joint Surgery*, July, 1934) has experimented upon normal rabbits to determine whether or not the extent of the muscular atrophy resulting from simple immobilization, as found by different workers, can be limited by allowing weight-bearing. One hind limb was immobilized for a period varying from one to six weeks and the amount of atrophy was determined by comparing the weights of the muscles of that limb with the weights of the corresponding muscles of the opposite side. To determine what constituted a significant variation, the weights of the corresponding muscle groups from the two sides of untreated animals were compared. In Group I, in which weight-bearing was allowed, plaster of Paris spica casts were applied to a group of rabbits with the right hind limb flexed in a natural position, weight-bearing thus being allowed but motion prevented. In Group II, in which weight-bearing was not allowed, another group of rabbits was put into plaster of Paris spicas, with the right hind limb fully extended so that weight-bearing was impossible. One rabbit from each group was killed at the end of each week for six consecutive weeks, the muscles were dissected out and their weights were compared, as in the control group. Microscopic section of the muscles was made and the bones

were weighed and radiographed. Each rabbit was allowed forty-eight hours of freedom from plaster before it was killed and the muscles were removed. The author's results showed that the muscles of the immobilized leg underwent definite changes, depending upon the length of time that the animal had been in plaster. There was often slight œdema of the tissues about the *tendo Achillis*. After the first week or two the muscles were found to be flabby, moist and pale. The red muscles had lost their colour and become indistinguishable from the white muscles. After six weeks' immobilization the changes were very striking, especially in those animals in which weight-bearing had not been allowed. The skin and subcutaneous tissue were not so freely movable as in the normal leg. The muscles were not compact groups of firm fibres, but were soft masses of pale, œdematous material with considerable areolar and fibrous tissue scattered through them. They were inelastic and not easily divided into groups. The bones showed no gross differences and no definite changes were evident in the radiographs. The bones of the immobilized leg usually weighed less than those of the other leg, but the difference was not enough to be significant. The author concludes that the atrophy of disuse is rapid and extensive, but that it can be limited greatly by allowing weight-bearing. This fact can be of practical value in the regulation of treatment leading to the reduction of the period of immobilization and allowing normal function in the form of weight-bearing at the earliest possible moment. Further studies are desirable in order to determine whether or not a muscle which has lost 30% to 40% of its weight and which shows definite histological changes, can completely regain its previous weight and normal structure.

Bone Marrow and Endosteum in Bone Regeneration.

W. H. MCGAW AND M. HARBIN (*The Journal of Bone and Joint Surgery*, October, 1934) state that the problem of adequate internal splinting by grafts, although still of great importance, has given ground to the problem of the osteogenic properties of grafts—a shift from the mechanical to the physiological viewpoint. They are impressed by the universal supremacy accorded to grafts which include periosteum, and by studies that indicate that the other elements of bone may also share prominently in the whole process of regeneration. Independent growth of cortical or compact bone deprived of periosteum and endosteum is possible, as shown by the work of Ollier, Macewen and Phemister, but this growth is slow and scanty. With adequate blood supply transplanted cortex will survive and in time, according to Wolff's law, will follow the plastic changes found in normal bone. How extensively the process of creeping substitution goes on in live cortical grafts

is not yet established. Many investigators have ascribed osteogenic properties to endosteum and bone marrow, although their importance has usually been given a secondary place. The cultivation of bone cells *in vitro* sheds light from another angle on osteogenesis and the possible survival of grafts. Dobrowolskaja, in his experiments, reports slight growth of bone cells from periosteum alone, a steady growth of bone cells from pieces of cortex, and luxuriant cell proliferation from spongy bone containing marrow. Periosteal blood supply, which nourishes the outer half of the cortex only, stimulates bone growth to a lesser degree and is unable to afford collateral circulation to the medulla in less than four weeks. The few transplants which included endosteum, though not enough to allow any definite conclusions to be formed, showed an even greater growth from endosteum than any other transplants, even including periosteum. Histologically the richest supply of osteoblasts is found in the bone marrow. They conclude that bone marrow and endosteum play a very active rôle in the formation of callus and new bone in dogs and, further, that free bone marrow and endosteal transplants will regenerate and bridge extraperiosteal fibular bone defects.

Chronic Osteomyelitis.

E. J. BOZSAN (*The Journal of Bone and Joint Surgery*, October, 1934) states that an area of aseptic bone necrosis anywhere in the skeletal system may be advantageously treated by connecting the necrotic segment with an adjacent living segment of bone by means of drill channels, and that the observations of Axhausen, Phemister, Santos, Freund and Cordes have definitely established that the essence of the spontaneous healing process of aseptic bone necrosis, brought about by any cause, is the substitution of living bone in the place of necrotic bone, effected by the slow penetration of tissue elements and capillaries of the adjacent living bone. The drilling of channels into the necrotic area presents nothing but the breaking of broad avenues to facilitate this invasion by new vessels. While attempting to compare the characteristic features of aseptic bone necrosis and necrosis in the wake of septic processes, such as suppurative osteomyelitis, the author has been obliged to come to the conclusion that, in spite of the seemingly great discrepancies, there was essentially no difference. The clinical and experimental observations of F. W. Bancroft on hæmatogenous osteomyelitis demonstrated that the substitution process is just as active in the recovery of these septic necroses as in the aseptic necroses. In the author's opinion this circumstance, rather than the supposed attenuation of the infection, is the reason for the good results obtained from the simple drill-hole evacuation of chronic bone abscesses recommended by Brickner.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on September 5, 1934, Dr. GERALD WEIGALL, the President, in the chair.

Cæsarean Section.

Dr. W. IVON HAYES read a paper entitled: "Cæsarean Section: A Review of 486 Consecutive Operations at the Women's Hospital, Melbourne" (see page 799).

A cinematograph film, taken by Dr. SYDNEY CRAWCOUR, was shown, illustrating the operation of Cæsarean section.

Dr. ARTHUR M. WILSON complimented Dr. Hayes on his paper and said that he had very little to add. Dr. Hayes's ideas very largely represented his (Dr. Wilson's) own opinions. Dr. Wilson emphasized the danger of subjecting to Cæsarean section a patient who had had previous handling. In the case of the toxæmias of pregnancy Dr. Hayes had recommended against Cæsarean section as a general rule, but Dr. Wilson was not quite sure about this. In England in 1914-1918 Cæsarean section had been rather the rule in eclampsia and similar conditions, and the results were at least not worse than by more conservative methods. Later, Dr. Hubert Jacobs returned from the Rotunda Hospital, Dublin, with strongly conservative ideas. Practically all the members of the staff at the Women's Hospital adopted these conservative methods for about a year, and this had been the best year in the history of the hospital as far as mortality from eclampsia was concerned, there being only three deaths from this cause. The following year, with the same conservative methods there was a 30% mortality from eclampsia, constituting one of the worst years in the history of the hospital.

Dr. Wilson had come to the conclusion that each case had to be considered separately on its merits. He made up his mind as early as possible whether to operate or not, the decision being based on the general appearance of the patient, blood pressure, the depth of coma, and whether she was in labour or not. If the patient was not in labour and was in deep coma, he advised Cæsarean section in a fair proportion of cases.

He considered the choice of anæsthetic very important and preferred nitrous oxide gas for this type of case. He considered that ether often caused death from bronchopneumonia in the first week.

In another type of patient, the patient suffering from the very severe preeclamptic condition, Dr. Wilson considered there was a big field for Cæsarean section. In patients suffering from renal toxæmia, such as chronic nephritis, typically those who had lost previous infants *in utero*, it was possible to carry the mother on till her infant became viable and then to do Cæsarean section rather than induction. In these patients the placenta was often in poor condition, with both red and white infarcts, and the induction tube might easily strip off a small amount of placenta and so cause the death of the infant.

Dr. Hayes's paper had dealt with the subject chiefly from the hospital point of view. From the point of view of the general practitioner the proportion of Cæsarean sections varied with different men. Potter, of Buffalo, in his recent book, described the histories of about 1,000 midwifery cases a year. Of these he had delivered 800 by internal version, 100 (or 10%) by Cæsarean section, 50 by forceps, 25 had been delivered spontaneously, and 25 infants were born before the arrival of the medical attendant.

Dr. Wilson said that in his own last thousand cases there had been fourteen delivered by Cæsarean section. Of these, six were sent with letters from other doctors. One had had Cæsarean section previously, one was suffering from a heart condition, two had contracted pelvis, one was very small and had had three previous stillbirths, and one, though pregnant, had both ovaries removed. Three of the fourteen came to him because of his specialty,

knowing that they presented difficult problems; one had had a previous Cæsarean section, the second was suffering from uterine inertia and the third from chronic nephritis. Five cases occurred in the course of his own practice. One of these patients had had one previous Cæsarean section and her own doctor had died in the interval. Of the others, one had had two previous Cæsarean sections. In the next the Cæsarean section was done because the presentation was a breech presentation with extended legs. Another was in a severe preeclamptic condition with a blood pressure of 220 millimetres of mercury. In the fifth the mother was a dwarf weighing four stone three pounds and was very small in build.

In this series there was no Cæsarean section performed because of contracted pelvis.

Dr. Wilson said it was his practice not to induce labour in *primipara* on account of contracted pelvis. He preferred to give them trial labour whenever possible.

In this series there had been four cases of Cæsarean section which could be fairly included in his own series of one thousand confinements—one in a dwarf, two in patients suffering from severe toxæmia, and one in which the infant presented by the breech and had extended legs.

The question would be asked whether there were any cases in his last 1,000 in which Cæsarean section should have been performed; and his answer must be yes: three cases. In the first the babe was delivered only after a difficult labour and the mother afterwards had a relaxed vaginal outlet. In the second the birth was a breech; there was scar tissue in the vagina and after a difficult labour the baby was born dead. In the third the mother had had a tuberculous spine with fusion of the third, fourth and fifth lumbar vertebrae. There was a brow presentation. Internal version was performed, but the babe was born dead.

The danger of doing Cæsarean section in cases in which there had been previous interference with manipulation had been stressed, and with this Dr. Wilson entirely agreed. When there had been any manipulation it was advisable at all costs to deliver *per via naturales*.

To prove this contention the following series of cases, to which he was called as a consultant during the last five years, were quoted:

Cases of obstructed labour	92
Failed forceps	38
Impacted breech	12
Impacted shoulders	3
Brow presentations	2
Shoulder presentations	3
Other obstructed labours	34

In only one of these 92 cases was Cæsarean section resorted to, and in no case was the mother lost. In the "failed forceps" cases four babes were delivered by internal version and thirty-four were delivered by forceps; five infants were stillborn and there were no neonatal deaths.

Among the impacted breeches four babes were stillborn and there were two neonatal deaths.

In the three shoulder presentations and the two brow presentations the babes were delivered by internal version. There were no stillbirths or neonatal deaths.

The three infants with impacted shoulders were all stillborn. In the remaining obstructed labours twenty-seven were delivered by forceps, six by internal version. Five babes were lost.

In conclusion Dr. Wilson pointed out that the commonest cause of "failed forceps" was either failure to recognize a malposition or malpresentation or (and even more frequently) too early interference. He also laid stress on the value of internal version (under deep chloroform anæsthesia) as means of delivery in an obstructed labour.

Dr. ELLIOTT TRUE congratulated Dr. Hayes on his address and on the accuracy of the figures he had set forth. One important consideration which perhaps had not been sufficiently emphasized was illustrated by the dictum, "once a Cæsarean, always a Cæsarean". Rupture through the scar of a previous Cæsarean section was a common danger in subsequent labours. There was a considerable increase in mortality in Cæsarean section undertaken after rupture of the membranes, and in his opinion the operation should

not be performed later than twelve hours after the commencement of a trial labour. The Americans, especially De Lee, did do many lower segment Caesarean sections, often before labour started, and they preferred not to allow normal labour after a previous lower segment Caesarean section.

Dr. True was interested in Dr. Wilson's remarks. He had always thought that it was not fair to blame Caesarean section for the high mortality in cases of eclampsia, but considered that Caesarean section should be done early in this type of case. If this were done, he thought the results would compare favourably with those of the more conservative methods.

Dr. EDWARD R. WHITE thanked Dr. Hayes for a valuable analysis of recent work reviewed in a judicial and intellectual manner. Dr. White emphasized the importance of care in sewing up the wound after Caesarean section. The old saying that it took three to five minutes to get the babe out and fifty-five for sewing up had much truth in it. The tone of Dr. Hayes's paper generally had been conservative, and this attitude was supported by Dr. Wilson. In his own obstetrical work Dr. White had performed comparatively few Caesarean sections. Only one of these patients had died. In any series of cases of Caesarean section stormy convalescence was common.

Dr. White referred to Potter's recent book and said that he had seen Potter himself at work, performing his favourite operation of version under full chloroform anaesthesia. He had also seen De Lee do lower segment Caesarean section on several patients in Chicago six years ago. Most of these patients were small, fat Jewesses with small pelves, and the operation was performed always under local anaesthesia. Dr. Hayes's paper demonstrated the benefit of using the natural route for delivery whenever possible.

Dr. White said that he was not infrequently consulted by women nearing the age of forty for advice as to confinement with their first babe. He considered that the chances of normal labour were such that if they wished to be certain of a living babe, Caesarean section should be recommended.

Referring to the association of myomata with pregnancy, it had usually been considered that Caesarean section was indicated, but it was found that such patients were frequently delivered easily by the natural route. Even an obstructive tumour in the pelvis did not always indicate Caesarean section, as the tumour could sometimes be lifted out of the way by opening the abdomen.

Dr. ALAN ROBERTSON commented on the historical aspect of Caesarean section as far as Melbourne was concerned. When he was a resident medical officer at the Women's Hospital a Caesarean section was such a notable event that a large crowd of doctors would be in attendance to see it. On the obstetric side of the hospital the operation was performed in the labour ward.

Dr. Robertson agreed with Dr. White in recommending Caesarean section in old *primiparae*, and in these cases he thought it was wiser to do the classical operation itself, except where previous manipulation had taken place.

Dr. GERALD WEIGALL, the President, thanked Dr. Hayes for his paper and commented on the valuable discussion which it had elicited.

In reply, Dr. Hayes said that his statistics had been compiled originally not with the idea of publication, but when he had gathered them he had felt that they showed an important comparison with overseas figures. He had dealt only with the work actually done, and his paper was not intended as a complete discussion of Caesarean section. He did not combat Dr. True's statement that eclampsia should do well as a rule with early Caesarean section; nevertheless, it was difficult to decide to do Caesarean section in every case of early eclampsia. A mortality of 30% in eclampsia at the Women's Hospital, Melbourne, during the last nine years could not be considered satisfactory. There were no figures in the Women's Hospital records to indicate the danger from a lower segment scar. Some overseas writers said that the lower segment scar withstood subsequent labour better than the upper segment scar.

Referring to the confinement of elderly *primiparae*, Dr. Hayes said that on the whole he did not give them any different treatment from younger women, and as a rule they were delivered without special difficulty.

Dr. Hayes thanked Dr. Crawcour for his excellent cinematograph film.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Sydney Hospital on October 18, 1934. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff. Part of this report appeared in the issue of December 8, 1934.

Combined Subphrenic and Pulmonary Abscess.

Dr. LYLE BUCHANAN showed a man, aged forty-two years. The patient gave a typical history of duodenal ulcer for fifteen years. On August 18, 1934, he was admitted to hospital with a ruptured ulcer on the upper and anterior wall of the first part of the duodenum; he had been ill for four hours. The abdomen contained gas and turbid fluid. The ulcer was oversewn and the abdomen drained. The patient showed signs of chronic bronchitis. He progressed satisfactorily until September 3, 1934 (two weeks). He then complained of pain in the right side of the chest and shoulder. He looked toxic. His temperature varied between 38.3° and 38.9° C. (101° and 102° F.). The leucocytes numbered 36,720 per cubic millimetre, and 82% of them were neutrophile cells. Flat dulness was present at the base of the right lung. The patient was coughing up large amounts of foul-smelling sputum. However, the X ray findings suggested subphrenic abscess rather than empyema, and needling of the chest failed to disclose pus.

Under narco-local anaesthesia on September 8, 1934, the patient was explored for subphrenic abscess by a large needle, which failed to find pus. Portion of the ninth rib was resected posteriorly and adhesions were found between the lung, the chest wall and the diaphragm. An incision was made in the diaphragm and its inferior surface was found to be densely adherent to the liver. Exploration with the finger led to a large cavity filled with pints of foul-smelling *Bacillus coli communis* pus.

A drainage tube was inserted; it was shortened twelve days later and removed on the sixteenth day. The wound at the time of the meeting was discharging slightly. The patient felt well; his chart was normal. The cough cleared up rapidly within two to three days, showing that the intrapulmonary portion of the abscess, the presence of which was shown by large quantities of foul-smelling pus coughed up before operation, had probably drained satisfactorily through the diaphragm. The lung sounds were clear.

Cerebral Haematoma.

Dr. Buchanan's second patient was a man, aged thirty-seven years. He gave a history of receiving a blow on the head from the hood of a motor car while being driven in January, 1934. Immediate headache occurred and a "bloodshot" eye appeared two days later. Vomiting occurred from the third to the tenth day and the patient was out of hospital between the third and fourth weeks. He was readmitted to hospital with "headache, nerves and irregular vomiting" and was discharged after two days. He was readmitted to hospital a second time for two weeks in July, 1934, and was sent to Sydney for treatment, still complaining of headache and vomiting.

On examination no localizing signs or symptoms were found. Lifting and stooping caused dizziness, but nodding was not painful. The fundus, fields of vision, skiagram of the skull, urine, nose and throat were all normal. Examination of the cerebro-spinal fluid showed the glucose content to be 74 milligrammes per 100 cubic centimetres. The sodium chloride content was 790 milligrammes per 100 cubic centimetres. The colloidal gold test gave a normal result. Culture was sterile.

An encephalogram showed right-sided diminution of the whole lateral ventricle, suggesting general right-sided

pressure. An oval ring of fluid was present, about 5.0 by 3.75 centimetres (two by one and a half inches) of even outline, with a central fluid area over the upper part of the post-central gyrus.

A tentative diagnosis of subdural hæmatoma, partly absorbed, was made.

The patient stated that he felt well. (The encephalogram was prepared on October 3, 1934.)

Suggestions were invited regarding diagnosis and treatment.

Dr. RICHARD FLYNN agreed that the condition was one of extensive hæmatoma. His experience coincided, that headache was usually relieved permanently in traumatic cases by the preparation of the encephalogram alone. On account of the great size of this hæmatoma he advised cranioplasty, as the blood was unlikely to absorb, might become infected, and was possibly still causing pressure necrosis of brain cells.

Dr. D. G. R. VICKERY agreed that the skiagram revealed a hæmatoma, but drew attention to a dense shadow thickening of the inner table, and suggested an original fracture of the inner table.

Dr. K. B. VOSS hesitated to agree to the diagnosis from the skiagram on account of the same subcranial shadow, and suggested a further X ray examination, now that all air had absorbed, to eliminate the possibility of meningioma.

Dr. S. SHELDON recalled a similar case in an insane patient on whom he had operated to remove the clot, with complete restoration to normal life.

Dr. C. E. CORLETTE and other surgeons inquired regarding the safety of the procedure, concerning which Dr. Corlette at least had very grave doubts.

Dr. Buchanan, in reply, stated that he did not propose to take further action while the patient remained well, but would operate on the return of any symptoms. His series of cases in both traumatic and idiopathic epilepsy and in old subdural hæmatoma had been without morbidity or mortality attributable to the encephalogram. Those epileptics who had had temporary apparent cure and had relapsed, had voluntarily applied for and undergone a second treatment. He promised to follow up as far as possible the whole series and to show the available patients at a future meeting.

Chondroma of the Tibia.

Dr. Buchanan also showed a woman, aged twenty-three years, who had a tumour, the size of a duck's egg, growing from the medial tuberosity of the tibia. There was a five years' history and the patient had complained for one week of night pain, relieved by aspirin, phenacetin and caffeine powders.

X ray examination revealed a chondroma, with irregular porosis extending 1.25 centimetres (half an inch) into the bone, involving both epiphysis and metaphysis and extending to the joint cartilage; the outline of the actual joint was normal.

Discussion was invited regarding diagnosis and treatment. All radiologists agreed that malignant disease could not be excluded.

Dr. C. E. CORLETTE and Dr. ARCHIE ASPINALL both advised operation and section with subsequent radiotherapy if microscopic examination revealed malignant disease, which was, in their opinion, more than doubtful. Many cases were claimed as cures for radiotherapy which were not malignant. If in all such cases pre-operative radiotherapy were instituted, it would create a false impression of its value and ultimately cause much more harm than good. One of the points of greatest importance was to establish whether or not biopsy or operation actually increased the risk of dissemination within the period required before radiotherapy could be applied.

Dr. D. G. R. VICKERY advised immediate excision and dependence on clinical findings. He would advise radiotherapy on the fifth day after operation, if assured that there was no sepsis in the wound.

Dr. A. T. NISBET advised pre-operative radiotherapy and operation eight weeks later. At that stage the whole body, as well as the local area, would be more resistant to dissemination.

Osteogenic Sarcoma of the Femur.

Dr. Buchanan showed a boy, aged sixteen years, who, five weeks previously, had noticed a swelling over the lower end of the right thigh. The swelling was not painful and had increased rapidly in size since it first appeared. The patient gave a history of having suffered from osteomyelitis of the lower end of the right tibia five years previously. He was being treated by Dr. A. T. Nisbet with deep X ray therapy. Neither the Wassermann nor the Casoni test yielded a reaction. X ray examination revealed an osteogenic sarcoma of periosteal type completely surrounding the femur and twenty centimetres (eight inches) in length.

Urological Conditions.

The demonstration in the Department of Urology was arranged by Dr. R. H. BRIDGE and Dr. KEITH KIRKLAND.

Many interesting pyelograms were shown, together with the renal and ureteral specimens subsequently removed at operation.

Dr. Bridge remarked on the various examples of renal tuberculosis and pointed out the necessity for repeated examinations of the urine when frequency of micturition and dysuria could not be explained. He commented on the relative failure of the excretion methods of urography to demonstrate early renal tuberculosis. In the case of some of the specimens shown, in which the lesion was very obvious to the naked eye and equally obvious in the retrograde pyelograms, the excretion urogram was certainly not in any sense diagnostic.

Pyelograms of horseshoe kidneys, double ureters and of various growths of the kidney and renal pelvis were shown.

Two specimens that excited considerable interest were primary papillomata of the lower end of the ureter. Dr. Kirkland commented on the rarity of the condition and the operation for its relief. He said that nothing short of nephro-ureterectomy with a subsequent examination of the bladder for recurrence should be considered as sufficient. The patients from whom the specimens were removed were sixty and sixty-one years of age, and it was not considered feasible to do the complete operation in one stage. Dr. Bridge pointed out that a nephrectomy and upper ureterectomy, with particular attention to the ureteral stump, followed by a lower ureterectomy six weeks later, did not appear to add to the risk of implantation.

A boy aged twelve years was shown. Following a street accident he was admitted to hospital and discovered to have slight hæmaturia. Examination revealed that the patient had a large amount of residual urine, the bladder, after voluntary emptying, almost reaching the umbilicus. Decompression followed by catheter drainage for some months was adopted, at the end of which time the patient improved amazingly. "Uroselectan" pictures provided graphic evidence of the improvement in the anatomy of the ureters and kidneys, while the blood urea content became normal. At operation a lunette valve or fold was found just external to the internal meatus. This was divided. The bladder healed uneventfully. The patient, when seen two months after operation, had put on more than a stone in weight, had a good urinary stream and no residual urine.

(To be continued.)

Medical Practice.

THE DANGEROUS DRUGS ACT IN NEW SOUTH WALES.

THE Council of the New South Wales Branch of the British Medical Association has requested us to publish the following statement, in which are set out the obliga-

tions imposed on medical practitioners in regard to the prescribing, keeping of records, and dispensing of certain drugs by the provisions of the *Police Offences Amendment (Drugs) Act, 1927*, commonly referred to as the *Dangerous Drugs Act*.

POLICE OFFENCES AMENDMENT (DRUGS) ACT, 1927.

Instructions to Medical Practitioners.

The Act.

The above Act regulates the manufacture, sale, possession, distribution and supply of opium and certain other dangerous drugs.

Dangerous Drugs.

The dangerous drugs to which the Act applies are:

(a) Morphine, cocaine, ecgonine and diamorphine (commonly known as heroin), and their respective salts, and opium, and any preparation, admixture, extract or other substance containing not less than one-fifth *per centum* of morphine or one-tenth *per centum* of ecgonine, cocaine or diamorphine.

For the purpose of the foregoing provision the percentage in the case of morphine shall be calculated as in respect to anhydrous morphine.

(b) Barbituric acid and all substances or preparations obtained directly or indirectly from or combined with barbituric acid, whether described as veronal, medinal, dial, luminal, sodium luminal, or by any other trade name, mark or designation; Indian hemp (*Cannabis Indica*), including the resins obtained from Indian hemp, and any preparation, extract or tincture of Indian hemp; paraldehyde or its preparations.

The percentages specified in sub-paragraph (a) hereof do not apply to the drugs set out in this paragraph.

Authority to Procure and Have Drugs.

Medical practitioners are authorized under the Regulations to be in possession of any drug for the purpose of their profession or employment, subject to the conditions and restrictions prescribed by the Regulations.

Supplies.

The method of obtaining supplies is the submission to the supplying source of a written order on a personal letterhead of the medical practitioner, couched in the following terms:

Please supply on my behalf the following drugs (herein set out drugs required). Charge to my account.

This order must be signed with the usual signature of the person ordering; initials will not be accepted.

In respect to this order, a receipt would normally be given, in the ordinary course of business proceedings, when the goods are actually delivered. If this is done, it is unnecessary to sign the drug register.

Records of Supplies and Issues.

Regulation 12.—Where a person authorized to have drugs in his possession for the purpose of his profession or employment does not manufacture, detail, dispense or compound drugs, or where such dispensing or compounding is done by a medical practitioner, registered dentist, or registered veterinary surgeon for the purpose of treatment under his instructions or his direct personal supervision, it shall be a sufficient compliance with Regulation 10 if such person keeps a record of:

- The drugs obtained by him and the quantities of each;
- The person or firm from whom he obtained such drugs;
- The drugs disposed of or used by him and the quantities of each;
- The manner in which such drugs were disposed of or used; and
- The drugs remaining in his possession and the quantities of each.

Such records shall be in a book either written in ink or gummed or pasted on the pages when the invoices *et cetera* are used for the purpose, and shall, together

with the drugs then in the possession of the authorized person, be produced for inspection on demand by the Board or its officer authorized either generally or specially in that behalf.

It will be observed that the above record is merely a record of receipts and issues, entries made under (a) and (b) representing the entries for receipts, and (c) and (d) the entries for issues. The total of the issues, subtracted from the total of receipts, should indicate quite clearly the stock on hand, i.e., sub-head (e).

It will be further observed that this type of record can only be used by a medical practitioner where dispensing is done for the purpose of treatment under his direct instructions or personal supervision.

Where medical practitioners dispense for sale to patients and thereby carry out the duties normally carried out by a registered pharmacist, they are required to keep a register in the form of Schedule No. 5 to the Act (see Appendix No. 1).

Entries in such register shall be written in ink on the day of the transaction. Such register shall be kept on the premises on which the drugs are dispensed *et cetera*, and will be available at all times for inspection by authorized persons under the Act.

Alterations, obliterations or cancellations shall not be made in any register, and any mistake made in an entry may be corrected by a marginal or foot note, initialled and dated.

Retention of Records.

Regulation 13.—All records, prescriptions, invoices and other documents relating to drugs and transactions in regard thereto belonging to any person licensed or authorized under the Regulations to manufacture, procure or supply any drug shall be kept by that person for not less than two years from the latest date on which such records or prescriptions, invoices or documents were made or acted upon.

On demand by the Board or its officer authorized either generally or specially in that behalf, the holder of any license or other authorized person shall furnish particulars of the quantities of any drugs on hand, obtained and disposed of.

Prescriptions.

Medical practitioners and veterinary surgeons are the only persons authorized under the Regulations to write prescriptions for the supply of drugs.

Prescriptions can only be issued under the following conditions:

Regulation 16.—Where a medical practitioner or registered veterinary surgeon issues a prescription for the supply of a drug he shall comply with the following conditions:

- The prescription shall be in writing, shall be dated, shall bear the name and address of the person for whom the prescription is given, shall be signed by the medical practitioner or registered veterinary surgeon by whom it is given, shall show the address of such medical practitioner or veterinary surgeon, and shall clearly indicate the maximum number of times such prescription shall be dispensed.
- The prescription shall be given by a medical practitioner only for the purpose of obtaining the drug for use in the course of medical treatment, and by a veterinary surgeon only for the purpose of obtaining the drug for use in the course of the treatment of animals, and shall be marked "For animal treatment only".
- Where the prescription contains an unusual dose or what may be regarded as a dangerous dose, the prescriber shall indicate that such is intended and not inadvertent by underlining that part of the prescription and initialling the same in the margin.
- The prescription shall not bear the impression of a rubber stamp or other such contrivance in lieu of the written signature of the medical practitioner or veterinary surgeon by whom it has been issued.
- The prescription shall not be written in cipher.

Particular attention is invited to sub-paragraphs (a) and (c) hereof, and the omission of any of the details required by these sub-paragraphs constitutes an offence by the medical practitioner under the Act, and the registered pharmacist to whom the prescription is presented for dispensation is quite entitled to refuse to dispense the same, as he also is liable if he dispenses a prescription which is not completed in accordance with this regulation.

Dispensing in Emergent Cases.

Regulation 17.—Where a medical practitioner or registered veterinary surgeon in a case of emergency orally or by telephone or telegram directs the dispensing of a drug, he shall forthwith write a prescription complying with the conditions prescribed in Regulation 16, mark such prescription so as to show clearly that it has been given as a confirmation of the directions given by him orally or by telephone or telegram, and dispatch such prescription without delay to the person by whom the drug was dispensed.

Labelling.

Regulation 21. (1) No person shall supply any drug unless the package or bottle containing the drug is plainly labelled or marked to show the amount of such drug contained therein.

(2) No person shall supply any preparation or admixture containing any drug unless the package or bottle containing such preparation or admixture is plainly labelled or marked to show the total amount of such preparation or admixture in the package or bottle and the percentage of the drug contained therein, or in the case of tablets or other articles, the number of such tablets or articles in the package or bottle and the percentage of the drug contained in each tablet or article.

Provided that this Regulation shall not apply to any drug, preparation or admixture dispensed in accordance with the Regulations.

Infamous Conduct in a Professional Respect.

Regulation 22. (1) A medical practitioner, registered veterinary surgeon or registered dentist shall not:

- (a) Knowingly give a prescription for a drug merely for purposes of addiction; or
- (b) Knowingly supply or administer a drug merely for purposes of addiction.

(2) In addition to any penalty imposed by the Act or Regulations, a breach of this regulation shall be regarded as infamous conduct in a professional respect.

Authority for Prescribed Persons to Procure and Have Drugs.

Regulation 8. (1) Until in any particular case such authority is withdrawn:

- (a) a medical practitioner,
 - (b) a registered pharmacist employed in dispensing medicines at any public hospital or other institution,
 - (c) a person in charge of a laboratory for the purpose of research or instruction,
 - (d) a registered dentist,
 - (e) a registered veterinary surgeon,
 - (f) an analyst appointed under the *Pure Food Act*, 1908, and
 - (g) a nurse employed in a public hospital or public institution (so far as the possession or use of such drug is required in connexion with its administration to a patient under the instruction of a medical practitioner),
 - (h) a nurse employed by the New South Wales Bush Nursing Association (so far as the possession or use of such drug is required in connexion with first aid treatment or its administration to a patient under the instruction of a medical practitioner),
- is hereby authorized to procure and be in possession of any drug for the purpose of his profession or employment, subject to the conditions and restrictions prescribed by the Regulations.

(2) A person to whom a prescription for a drug has been given is hereby authorized to procure and have possession of the drug to the extent specified in the prescription.

Regulation 9 is the regulation authorizing registered pharmacists to retail, compound or dispense, but only to persons licensed or authorized under the Regulations to be in possession of drugs.

It will be observed from the above authorities that hospitals are not authorized to be in possession of drugs unless they are duly licensed to procure and supply drugs under the Act.

Medical practitioners should therefore exercise care in respect to instructing matrons of private hospitals to administer drugs, unless they are aware that the hospital is licensed under the Act.

An offence under the Act is committed by the medical officer who instructs any matron in this manner.

Notes With Regard to Appendix.

Records of Supplies and Issues, page (2): The records of supplies and issues kept by medical practitioners should be kept in a similar manner to that indicated by the appendix.

Appendix No. 1. Drug Register.

Name of Drug:

RECEIPTS (left-hand page).

Date Received.	Form in Which Received.	Quantity Received.	Supplying Source.	
			Name.	Address.
Grand Total:				

ISSUES (right-hand page).

Date of Issue.	Issued to		Quantity Issued.	Form in Which Issued or Used.	Authority for Issue.		Signature of Recipient.
	Name.	Occupation and Address.			Ward Symbol or Prescription.	Order or Prescription Number.	

Total of Issues:
Balance Stock on Hand:
Grand Total:

Separate pages are to be used for each drug kept in stock, the left-hand page being a complete record of all receipts and the right-hand page of all issues. The stock on hand, as indicated by the total of the issues page, should be occasionally checked to verify the preceding entries.

In the column headed "Authority for Issue" the words "Ward Symbol or Prescription" appear. These apply more particularly to hospital internal administration, and in lieu thereof a medical practitioner should insert the words "Licence or Prescription".

Manufacture of Stock Mixtures.

This transaction requires an entry on the issues side of the drug register, relative to the quantity used in the mixture, the indication being: "Used in the manufacture of" This is the only entry required where the subsequent mixture is exempt from the Act by virtue of its percentage content.

Where, however, the resultant mixture is still within the Act, a fresh entry should be made in the drug register, and on the receipts side of the register the total of the mixture thus manufactured should be entered. Under the column of "Person or Firm Supplying" should be entered "Manufactured".

Correspondence.

MATERNAL MORTALITY.

SIR: The Commonwealth Government is reported to contemplate spending £75,000 on an investigation into the causes of maternal mortality and morbidity. I have written to the Prime Minister suggesting with proper respect that it is not research but administration which is requisite.

Some ten years ago the Edward Wilson (of *The Argus*) Trust, after full discussion, placed £10,000 at the disposal of the University of Melbourne to enable the problem to be investigated. The work was entrusted to Dr. (now Professor) Marshall Allan and occupied the period from November, 1925, to April, 1928, when his report and recommendations were published.

They include a reference to the report of the Federal Health Commission of 1926, so far as maternal hygiene is concerned. During that period the Victorian Bush Nursing Association decided to place its maternal records at his disposal and shortly afterward entrusted him with the direction of its obstetrical department. Up to June 30, 1934, the results in the Victorian Bush Nursing Association, so I understand, have not been surpassed elsewhere on the globe. During a period of fourteen years the result was a mortality of 1.67 per 1,000 births and a rate for stillbirths and neonatal deaths about half the State rate. The total number of births exceeded 9,000.

I have never imagined that these rates can be continued indefinitely, as there must be accidents and complications occasionally. But they are sufficiently extensive and uniform to warrant the belief that it is not research which is required, but the application of the knowledge gained by Professor Marshall Allan's investigation, not only to the Victorian Bush Nursing Association, but in general.

In the Victorian Bush Nursing Association all nurses hold two or three certificates, and in the hospitals, some forty-two in number, all cases are attended by medical practitioner and nurse. Antenatal care is almost universal.

In these circumstances it would seem a waste of money to duplicate the investigation. But money might be applied for the better training of nurses and possibly of medical students, and for the diffusion of the knowledge gained. It would be unfortunate if money is spent on

ground already covered by the report of the Federal Royal Health Commission in 1926 and Professor Marshall Allan in 1928.

Yours, etc.,

JAMES W. BARRETT.

103-105, Collins Street,
Melbourne,
December 3, 1934.

SIR: Your informative leader on the problem of maternal mortality goes to the root of the matter when it suggests the coordination of investigations. Alongside of Dr. E. Sydney Morris's treatise (1925) and the report of the Federal Royal Commission on Health (1926) must be put the report on maternal mortality and morbidity in the State of Victoria by Dr. (now Professor) Marshall Allan (1925 to 1928), published in *THE MEDICAL JOURNAL OF AUSTRALIA*, June 2, 1928. That report, which was made for the Obstetrical Research Committee (of which I was a member), was an accurate clinical picture of obstetric practice as Professor Marshall Allan saw it in a personal and intimate study of childbirth throughout the State of Victoria. His findings suggested recommendations of a practical character. The principles that are involved in ideal obstetric practice, that go to the making of a practice that shall be free from reproach, have been stressed many times in this journal. As you rightly say, "the medical profession must recognize its responsibility". In view of the contemplated expenditure by the Commonwealth Government of a large sum of money for investigation of the causes of maternal mortality and morbidity, I venture to say that much time and money may be saved by avoiding repetition of work already done.

Yours, etc.,

FELIX MEYER.

Collins Street,
Melbourne,
December 6, 1934.

FRACTURES OF THE FEMUR.

SIR: Within the few weeks since the debate on the treatment of fracture of the femur I have been reminded of two things which I had forgotten. First, there is one exception to the rule that Thomas's bed knee splint is the best for all fractures of the femur distal to the neck of the femur. This fracture is the displacement forward of the lower epiphysis of the femur, which may very rarely occur and give rise to the pressure on the popliteal vessel and nerve by the backwardly displaced distal end of the diaphysis. In such case complete flexion of the knee at first, and gradual extension later, is the correct treatment. Secondly, it was not I who put the particular case which made such a strong impression on Colonel Storey into the Thomas's splint in Palestine. The credit should go to Captains Van Epen and Marsh.

Yours, etc.,

E. B. M. VANCE.

135, Macquarie Street,
Sydney,
December 10, 1934.

Obituary.

MATTHEW MACNAMARA.

DR. L. M. McKillop has forwarded the following appreciation of the late Dr. Matthew Macnamara:

The late Dr. Matthew Macnamara, who died a few weeks ago at the Mater Misericordiae Hospital, Brisbane, at the age of seventy-four years, was born in Limerick, Ireland. After receiving the qualifications of L.R.C.S. and L.R.C.P. at Dublin in 1885, Dr. Macnamara went to London, and during 1886 and 1887 acted as *locum tenens* in an extensive practice in one of the poorer quarters of that city, a cir-

cumstance which no doubt had an influence in giving him a wide outlook in the charitable work for which he was noted at a later date in South Brisbane. Towards the end of 1887 Matthew Macnamara, at the instigation of one of his brothers, who had joined the priesthood, came to Australia and after a short time spent as an insurance doctor decided to establish a practice at Woolloongabba, Brisbane. At that time medical men were scarce, calls long and frequent, and roads bad, and Dr. Macnamara, never a very robust man, was called upon to work long and arduous hours. His generosity and regard for the poorer patients especially caused him to be held in high esteem by all classes of the community. Just prior to the outbreak of the war he decided to retire from practice and left for the Continent. At the actual beginning of the conflict he was in Vienna and found some difficulty in getting back to England. Later on he returned to Australia and after a further visit a few years ago to England, Ireland and the Continent, returned to Brisbane, where he lived in retirement until his fatal illness—a type of progressive muscular atrophy—overtook him.

Matthew Macnamara was one of the old type of general practitioners—capable, courteous and considerate. He was a general favourite in and out of the profession. In 1921 he suffered from a severe attack of general peritonitis, due to a ruptured appendix, and it is possible that this illness laid the foundation of his terminal ill-health, though it did not prevent his acting as relieving medical officer on the staff of the Mater Misericordiae Public Hospital on several occasions when junior medical officers were unprocurable.

Dr. Macnamara was unmarried. The funeral cortege to Nudgee Cemetery was followed by a representative gathering of personal and professional friends, who stood by to watch consigned to Mother Earth the body of one of Nature's gentlemen.

FRANK HOBILL COLE.

We regret to announce the death of Dr. Frank Hobill Cole, which occurred on December 6, 1934, at Melbourne, Victoria.

Books Received.

- AIDS TO OSTEOLOGY**, by P. Turner, B.Sc., M.B., M.S., F.R.C.S., in collaboration with N. L. Eckhoff, M.S., F.R.C.S.; Third Edition; 1934. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 229. Price: 4s. 6d. net.
- HYPNOTISM IN THE TREATMENT OF DISEASE: ITS SCOPE: A PLEA FOR RESEARCH**, by B. L. Lloyd, M.B., D.P.H.; 1934. London: John Bale, Sons and Danielsson. Crown 8vo., pp. 49. Price: 3s. 6d. net.
- ALLERGY IN RELATION TO LYMPHADENOMA**, by G. P. Chandler, M.D., M.R.C.P.; 1934. London: John Bale, Sons and Danielsson. Demy 8vo., pp. 111. Price: 10s. 6d. net.
- CLINICAL SCIENCE ILLUSTRATED BY PERSONAL EXPERIENCES**, by Sir Thomas Lewis, C.B.E., F.R.S., M.D., D.Sc., LL.D., F.R.C.P.; 1934. London: Shaw and Sons. Royal 8vo., pp. 197, with illustrations. Price: 12s. net.
- THE HUMAN GYROSCOPE: A CONSIDERATION OF THE GYROSCOPIC ROTATION OF EARTH AS MECHANISM OF THE EVOLUTION OF TERRESTRIAL LIVING FORMS**, by A. Kenelby, L.R.C.P.; 1934. London: John Bale, Sons and Danielsson. Foolscap 4to., pp. 313, with illustrations. Price: 12s. 6d. net.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xiii, xiv, xv.

HOBART PUBLIC HOSPITAL, HOBART, TASMANIA: Junior Resident Medical Officers.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officers.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Radiologist.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

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